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Risk management recognition model and its effectiveness in Iranian banks

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KEYWORDS
risk management, banking, risk strategy, financial literacy, risk dimensions

Abstract

This research was conducted with the aim of recognizing the risk management model and investigating its effectiveness in Iranian banks. The design of this research was of mixed exploratory type (qualitative-quantitative). The population of this research in the qualitative part was experts and experts in the field of risk management, management and banking, risk strategy, which was selected by criterion sampling method and saturation was achieved after interviewing 11 people. In the quantitative part of the society, all the experts, involved and the audience were involved in the subject, and 385 people participated in the research in the available way. The research tools were interviews in the qualitative part and questionnaires in the quantitative part. Findings based on semi-structured interviews with experts in this field showed that 4 components of investment, financial knowledge, risk dimensions and macro factors are based on 13 main themes and 45 sub-themes of concepts related to the risk management model in Iranian banks. The review of the structural equation model confirmed all the research relationships and the paths of the model and showed that all the identified dimensions are effective in the risk management of Iranian banks. Due to the optimal fit of the designed model, this model can be used in efficient risk management in Iranian banks.

Introduction

The new business structure, despite common business organizations in the work structure, has made the necessity of business competitiveness, risk-taking and its management, and success in business based on the principles related to it, an important and fundamental factor in this field (T[1] and colleagues, 2020). Effective management of risk and knowledge is an important basis of success and progress, and it can be realized based on the implementation of an efficient structure model (Daradke[2], 2023). An efficient model refers to a coordinated executive structure and the use of constructive decisions in the context of the subject under investigation (Fatma and Khan, 2023), based on this, the choice and decisions based on the organization is an important and fundamental thing in the growth and development of the organization (Siluria and Simoez[3], 2018) and accordingly, the model is based on important decisions related to business growth and profitability and is an important concept related to organizational success (Marsan et al., 2023, Monica et al., 2023). One of the important topics in the success of any structural and commercial organization such as a bank is the field of roadmap and planning path, and in this context, the business function and its model at various levels are associated with various risks in this sector (Fernandez[4], 2016). A favorable investment refers to a comprehensive initial, developmental-gradual and final plan and policy which by placing all the elements together and predicting the turbulences of the business sector, predict the context of success and growth in the field and include the basis of success in it (Ho et al.[5], 2015). Despite all this and despite the comprehensive importance of paying attention to all elements for safe and low-risk investment,

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in general, every branch of management and business always requires special needs at the moment and in the situation; which requires comprehensive and goal-oriented policy principles in this field. Safe and low-risk investment in the business process is a fundamental and important structure in achieving goals and achieving business success, which requires a comprehensive and detailed program in various fields. The basis of a low-risk investment requires the use of correct and efficient management to guide the process under review, basic analyzes and the necessary tooling to achieve the goals ahead (Albana[6] et al., 2015), analyzes of existing facilities and weaknesses and the complete identification of the requirements and available tools in moving towards the specified path ,in this course and current situation, one of the most important indicators of the recent era in the field of core technology and its related dimensions is artificial intelligence and its related dimensions.

[1] Tae
[2] Daradkeh
[3] Silveira, C., & Simões
[4] Fernandez
[5] Hua
[6] Elbanna

One of the parts related to artificial intelligence is its use in management accounting. The impact of the implementation of artificial intelligence in management accounting (AIMA), considering the opportunities offered by technologies such as (Blockchain), big data and considering the early stages of using these technologies, is still unclear (Damerji et al., 2021; González et al., 2022) and knowing this structure with the aim of risk management and constructive structural decisions in the banks of the country, in line with the modernization of the business model, is a fundamental and important issue, and if the relevant dimensions are known, well-considered decisions can be made and in this field, no comprehensive research has been done in the field of risk management and its effective dimensions and this investigation in the banking system has been associated with more limitations and gaps, which this research with a deep and analytical look tries to investigate and understand the concepts related to it and based on this, he raises his main question, what are the characteristics of the risk management knowledge model in Iranian banks?

Theoretical

risk management

The financial crisis of the last decade has affected the financial stability of banking systems, and the effects of this crisis are much more severe than all the scenarios that banks have been exposed to. Investigations prove that financial institutions operate with ineffective and inadequate risk management, where risks are not properly identified, managed and monitored. In order for a banking system to be recognized as stable, it must work with balance and in different economic conditions and not need external resources to support its activity (Christie[1], 2021; Fontenola[2] et al., 2020).

In the importance of risk and financial crisis, in the period after the great financial depression that occurred in 1920 in America and Western countries, a large and significant financial crisis did not occur until the last three decades of the 20th century. However, from 1980 to 2010, new financial crises emerged, the most important of which was the financial crisis (2008) that started in America and spread to other countries in the world (Mashiri and Nadali, 2012). Investigations in this field confirm that the root of problems in banking systems and financial crises is the lack of effective risk management and the lack of proper use of the risk strategy system.

In this context of risk, i.e. the lack of awareness of future events, especially those events that have negative effects on business, risk can be defined as the potential for loss or damage to an entity where such an entity can be a person, a group, an organization, a system or a resource (Raval[3] et al., 2007), according to Peter Drucker in defining risk management as "the ability to manage the unexpected",

[1] CRISTEA
[2]Fontnouvelle
[3] Raval

while Gray et al. (2002: 44) consider it a preventive approach to minimize the negative consequences of adverse events that may occur. The first step in risk management is to identify potential risks (Asmundsen et al., 2020), and accordingly, risk management is the process of identifying risk, reducing it to an acceptable

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level, and finally evaluating the results on the system (Gray et al., 2002).

Banking risk

The understanding of banks' risk by board members, executive management and other employees is of great importance for effective risk management (Abu Hassan and Al-Ajim, 2012; Engineer, 2020). Despite the benefits of enterprise risk management, its implementation has not been widely implemented and there are various factors related to this problem. Trofimchak et al. (2020) as well as Gordon[1] et al. have provided a framework for the adoption of enterprise risk management and company performance, which is related to a number of internal and external factors of the company, which include: environmental uncertainty, level of industry competition, firm complexity, firm size and board oversight.

Considering the new business structure and the changes based on it, which are caused by the complexity of the environment and its surrounding conditions, management in any company should be based on short, medium and long-term strategies with flexibility in order to have the ability to coordinate with changes and respond correctly to environmental conditions, and the risk-based structure and its related conditions should also be considered. In this context, for the successful implementation of risk management in banks and the development of risk management activities, it is necessary that the implementation methods of risk management are well understood and implemented (Abdel Karim et al., 2020).

In a general analysis of the mentioned cases, today, the final plan of using risk management systems is not only to protect shareholder value, but to enhance shareholder value. Improving shareholder value in today's organizations requires identifying and monitoring all risks (Yahiazadeh Far et al., 2017) and in this context, compared to traditional risk management, effective organizational risk management such as a bank examines the set of risks of a company in a comprehensive and integrated way. This risk management method is considered as a part of the overall business strategy and one of its main goals is to increase the value of shareholders' wealth (Hewitt and Leibenberg[2], 2011). The greater complexity of the company (for example, the diversity of business transactions) is likely to cause less integration of information and more problems in management control systems in an organization (Gerdon[3] et al., 2009). In today's world, change is fast and successful adaptation is an important part of success (Beazley[4] et al., 2005). These studies show that there is a direct relationship between the strength of corporate risk management processes and environmental control (Jelilund et al., 2018).

[1] Gordon et al

[2] Hoyt and Liebenberg

[3] Gordon

[4] Beasley

Based on this and according to what was mentioned, it is a structural risk that mainly and widely covers related organizations such as banks and not having an effective approach such as risk management based on risk strategy mechanisms is a sign of failure and getting caught in damage, which this research tries to investigate and analyze with a mixed perspective.

Research background

Table 1. background research

Row	scholar	year	Found
1	Makwana and Pitroda	2017	In the study of the factors causing risk in various indicators using the AHP method, the researchers listed the most important factor in this field and the reduction of financial risk taking; in paying attention to customers and their needs and hiring employees according to their capabilities and according to the situation.
2	not	2017	The use of comprehensive formulation policies, efficient and successful regional model, and attention to the structure of the organization are the most important factors in reducing commercial risk-taking, and in the banking industry, the model of attention to balance sheets, capital, and financial knowledge is an important and effective factor.

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3	Noor Hafiza[1]	2017	Despite the accounting-based approach in this research, this research considers comprehensiveness as the most important principle in the success of planning in the risk structure, emphasizing the management application model.
4	Kadir Mohammad and Konabkva[2]	2016	Employing efficient intellectual capital and risk management plan reduces negative investment risks
5	Duffy	2019	Failure to pay attention to the correct application of risk system strategies increases the probability of failure in a specific structure
6	Saleh[3] et al	2020	The results show that credit risk, liquidity risk and bank capital variables have an effect on bank profitability. Understanding the Basel requirements and their importance by domestic and foreign bank managers is very important because their implementation can improve the bank's efficiency and increase profitability while exposing it to risk.
7	Kafideep[4] et al	2021	Failure to pay attention to strategic plans and structures of risk management causes the possibility of damage and bankruptcy in the banking structure.
8	Khai Nguyen and Dong	2022	This study analyzes the effectiveness of bank risk management in ASEAN countries and examines the specific role of risk governance in increasing the effectiveness of bank risk management. The results showed that the effectiveness of banks' risk management in ASEAN countries is low, and this issue is due to the lack of attention to financial knowledge.

Research Methodology

The design of this research is of mixed exploratory type, which first collects qualitative data. In order to identify the categories affecting effective risk management in Iranian banks, theme analysis was used, and in the next part, the amount of relationships was analyzed based on the structural equation model.

Society and example

The society in this research includes two groups

1. In the qualitative part of experts and experts in the field of banking, risk management, management model, etc., which was done with a criterion sampling method including having experience and expertise and a research background, saturation was achieved after interviewing 11 people.

Table 2. Descriptive characteristics of research subjects

Interview number	gender	position	age	work experience
Interview 1	Man	the manager	47	20 years
Interview 2	Man	deputy	45	14
Interview 3	Man	science Committee	36	4
Interview 4	Man	deputy	39	11
Interview 5	Man	deputy	40	15
Interview 6	Man	the manager	54	28
Interview 7	Female	deputy	48	20
Interview 8	Female	science Committee	39	8
Interview 9	Man	science Committee	46	13

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Interview 10	Man	the manager	49	15
Interview 11	Female	deputy	44	

[1] Nor Hafizah
[2] Kedir mohammed and Kenabkova
[3] Saleh
[4] Kafidipe

Based on the characteristics of the participants in the research, the age range of these people varied from 36 to 54 years, and the average work experience of these people was 14.5 years.

2. In the quantitative part, all the employees, experts and people related to the research topic included the target personnel who were selected in an available manner.

To determine the sample size in the quantitative section:

$$n = \frac{(1.96)^2(0.5)(1-0.5)}{(0.5)(1-0.5)} \approx 385$$

Cochran's formula was used to determine the sample size. The point that needs to be said about this formula is that if the value of p is not available, the value of 0.5 can be considered for it, in this case, this formula will give the largest and most conservative possible number, by placing the information obtained from the sample members and other investigated indicators, the number of sample members was considered to be 385 people.

findings

Qualitative section

The most important method of data collection in this research is based on the interview method. In order to achieve this final goal, Robert Yen[1] proposes the logic of repetition as the basis of this method. To validate the findings, peer review and note-taking during the interview were used, and the extracted themes were confirmed with the approval of the interviewees. Kappa coefficient of agreement was used in the reliability and reproducibility section. To measure the reliability of the final designed framework, the Kappa coefficient can be used, which shows the degree of agreement. In this case, either the entire work or all the required items are given to two experts in the form of a checklist with two values (yes/no) for ease of answering and saving time. After receiving opinions, the Kappa coefficient of agreement is calculated using the following formula, which is a number between 1 and +1.

$$k = \frac{p_0 - p_E}{1 - P_0} \quad (1)$$

Cohen's Kappa coefficient and Scott's P_i differ in how they calculate the expected agreement. While in Scott's P_i formula, the ratios observed in each of the values of a class reach the power of 2, in the kappa formula, the ratio of a specific value in a class used by the coder is multiplied by the ratio of the use of the same value by the second coder. These ratios are then added together to obtain the expected agreement. If the value of this coefficient is more than 0.6, there is reliability.

Table 3. Kappa statistic based on expert consensus

The power of agreement	**Kappa value**	**The value of the Kappa statistic in this research**
Low	0 to 0.2	0/83
Below average	0.21 to 0.40	
medium	0.41 to 0.60	
Good	0.61 to 0.80	
Excellent	0.81 to 1	

Guit (2014)

According to the statistic above 0.8, the agreement coefficient is at an excellent level

An analytical study in this field showed that among the factors affecting effective risk management in Iranian banks, 107 open codes were identified based on risk strategy mechanisms, which were identified by categorizing and focusing around the more important category of 45 indicators, 13 criteria and 4 main factors which we will discuss further. The 4 main components of investment, financial knowledge, risk dimensions and macro factors are the influential components in this sector.

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In the following, we will discuss each of the identified themes

Table 4. Content analysis of people's interviews related to risk management in Iranian banks

	Row	Main themes	Main sub-themes	Reproducibility of all sub-themes
investment	1	specialization	Specialized qualification, professional training, experience, instrumental expertise	14
	2	Knowing the conditions	needs assessment, instrumental needs, executive needs,	11
	3	Knowing the goal	Explanation of the goal, the means of the goal, the path to the goal	16
	4	Understanding the transition from current conditions to target conditions	Current positioning, optimal limit, distance between existing limit and optimal limit	11
	5	Vacancy and establishment	order management, weakness management, correction management	15
Financial knowledge	6	Financial engineering	perceptive tools, separation tools, having expertise in order; separation expertise	15
	7	Financial knowledge	Having knowledge and understanding of financial issues, policy budgeting, economic consequences, financial concepts, financial services	16
	8	Financial insight	Perception of success, perception of conditions, perception of the market	14
Dimensions of risk	9	Systematic risk	Global structure and conditions, domestic structure and	14

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			conditions, overall market	
	10	Unsystematic risk	Financial and structural conditions, instrumental and executive conditions, support and support conditions	14
Macro factors	11	Capital adequacy	The ratio of bank capital to risk-adjusted assets (RWA); the ability to provide, the ability to create new and pioneering structures	14
	12	Credit risk	The ability to communicate with customers and structural profitability, the ability to support liquidity, the ability to recover facilities,	13
	13	executive-operational dimensions	Liquidity ratio, profitability ratio, operational efficiency of the bank, economic growth, inflation	18

***A code may be repeated several times in an interview**

According to what can be seen, the semi-structured interview in this field showed that 4 components of investment, financial knowledge, risk dimensions and macro factors in relation to risk management in Iranian banks are based on the system of risk strategy mechanisms. Based on this, the most important themes in the investment sector include (expertization, knowing the conditions, knowing the goal, understanding the difference between the current conditions and the target conditions, finding gaps and establishment), in financial knowledge section included (financial engineering, financial literacy and financial insight), the risk dimension section included (systematic risk and unsystematic risk) and the macro section included (capital adequacy, credit risk and executive-operational dimensions).

After this stage, based on the identified themes and sub-themes, a questionnaire was designed, the validity of this questionnaire was proved through expert professors, and the internal consistency of the test items was measured through Cronbach's alpha. The results of this tool were as follows:

Table 5. Examining the psychometric characteristics of the researcher-made questionnaire

Factor	construct validity	Cronbach's alpha coefficients	Composite reliability
investment	0/563	0/851	0/884
Financial knowledge	0/589	0/801	0/836
Dimensions of risk	0/594	0/752	0/791

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Macro factors	0/701	0/839	0/871

The findings showed the psychometric properties of the research tool. Considering that the value of the AVE index for all research concepts and dimensions is greater than 0.50, since convergent validity is confirmed when the average value of the explained extraction index is greater than 0.50, therefore, it can be said that convergent validity is confirmed for all research concepts and dimensions. Also, the reliability of each component, which shows the internal fit of the test items, is more than 0.7 in all components, which shows the adequacy of the tool.

In the next step, the relationship between research variables was examined

The results of Pearson correlation between research variables showed that there is a significant (positive or negative) correlation between all research components in each group.

Since the correlation coefficients of the variables were significant, it was possible to use the structural equation modeling method. In the model of structural equations, the standard model is used to determine how and how much the variables influence each other, and the significance model is used to show the significance of these effects, and the fit indices are used to evaluate the fit of the model.

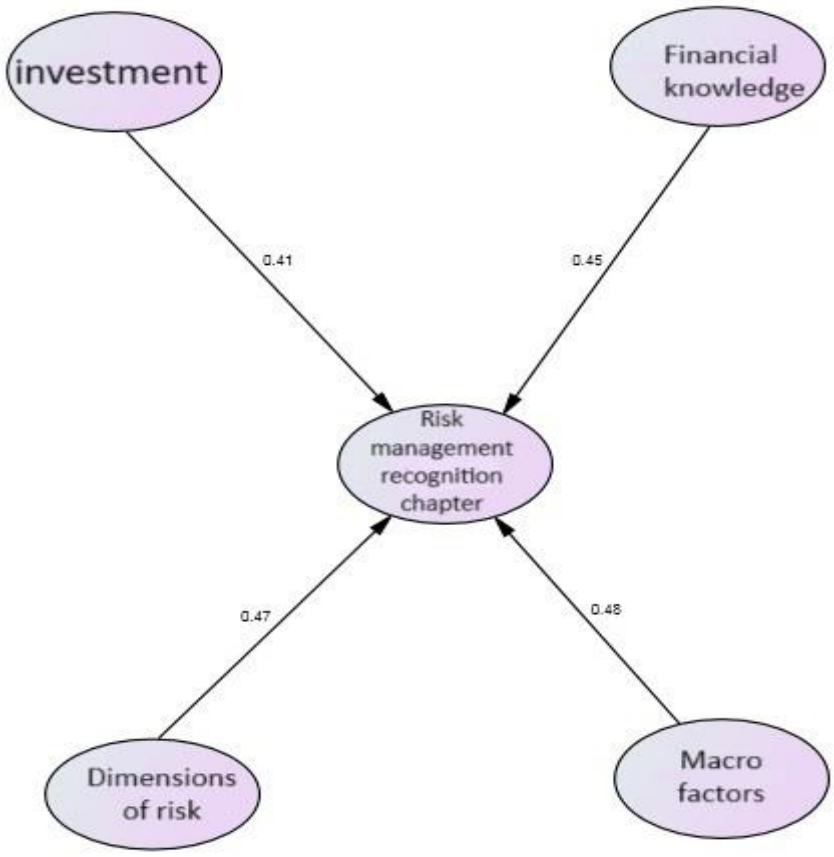

Figure 1. The structural equation model of risk management knowledge in the standard mode, investigating the role of factors related to risk management and its effectiveness in Iranian banks, emphasizing the role of risk strategy system mechanisms. Structural equation model was used for this part as well.

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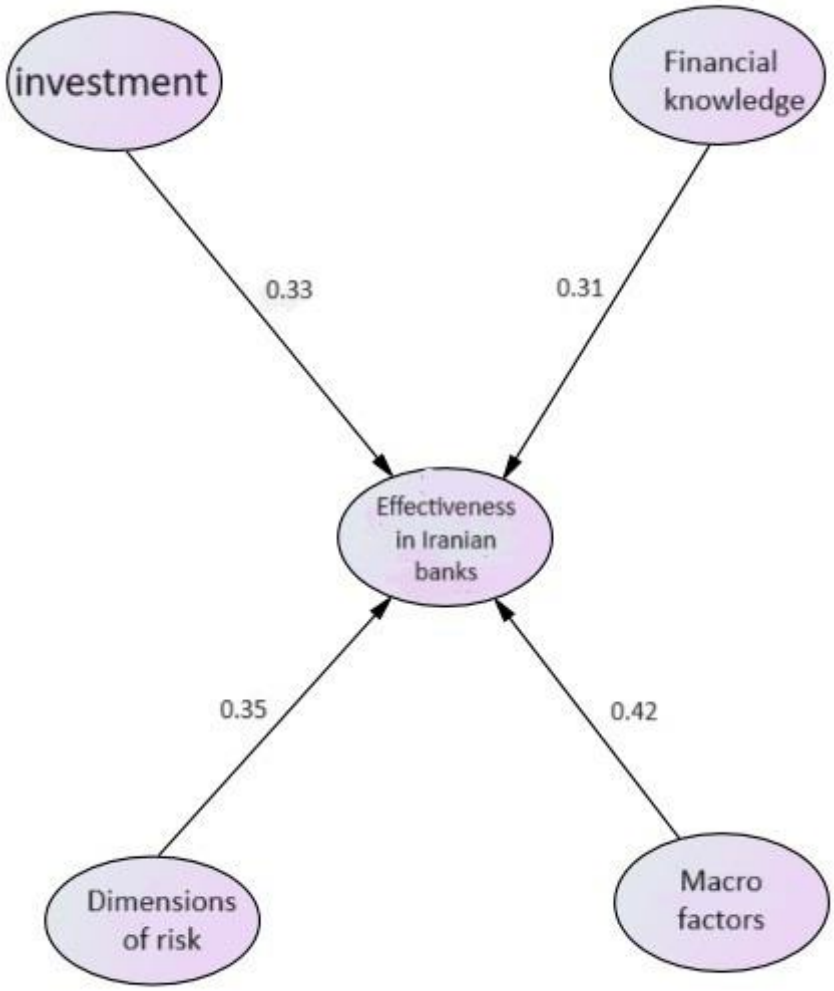

Figure 2. The effective structural equation model of each dimension of risk management in Iranian banks in the standard mode, in this section, all relationships were significant and consistent with the model. In the following, in order to check the effectiveness of the identified variables and the effects of each, the structural equation model method was used.

Table 6. The results of implementing the structural equation model

Row	**The origin of the relationship: independent latent variables (or ζ variables)**	**Relationship destination: dependent latent variable (or variable η)**	**Coefficient of determination**	**Significance coefficient (t-value)**	**Condition**
1	investment	risk management	0/41	11/44	Affirmation of relationship
2	Financial knowledge	risk management	0/45	15/22	Affirmation of relationship
3	Dimensions of risk	risk management	0/48	18/41	Affirmation of relationship

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4	Macro factors	risk management	0/49	19/77	Affirmation of relationship
5	investment	Its effectiveness in banks	0/33	7/64	Affirmation of relationship
6	Financial knowledge	Its effectiveness in banks	0/31	5/92	Affirmation of relationship
7	Dimensions of risk	Its effectiveness in banks	0/45	15/16	Affirmation of relationship
8	Macro factors	Its effectiveness in banks	0/42	12/09	Affirmation of relationship

Considering that the significance coefficient was lower than 0.05 and the t-statistical coefficients were above 1.96, it can be concluded that the identified components have an indicative and significant effect on the dependent variable and these identified variables have significant effectiveness in Iranian banks, emphasizing the role of risk strategy system mechanisms.

Examining the fit of the model

The following table shows the results of the indicators obtained from the implementation of the model;

.Table 7. Structural equation model fit indices

Statistical indicators	x^2	**AGFI**	**GFI**	**CFI**	RMSEA
risk management	589/22	0/92	0/89	0/91	0/046
Effectiveness in Iranian banks	610/88	0/90	0/88	0/90	0/055

According to the fit indices presented in the above table, the relative x^2 value calculated on the degree of freedom is less than 3 and in the rest of the indicators, AGFI, GFI, CFI is close to 0.9, which indicates adequate adequacy, and RMSEA is less than 0.08. In other words, it can be said that the research model has a good fit and the presented model is efficient in this field.

ranking

In the following, the indicators identified in each dimension of Friedman's rank test were used for ranking.

Table 8. Ranking of the investigated dimensions

risk management		**Its effectiveness in Iranian banks**	
component	**grade**		
investment	4		3
Financial knowledge	3		4
Dimensions of risk	2		2
Macro factors	1		1
Df=3 Sig=0.001		Df=3 Sig=0.001	

According to the findings, macro factors, risk dimensions, financial knowledge, and investment respectively have the greatest impact on risk management in Iranian banks, and the same ranking was found in the effectiveness of Iranian banks and only in the third and fourth ranks in this sector, investment has won the third rank and financial knowledge has won the fourth rank. Also, according to the results of the Friedman test, which shows a significance level of less than 0.01, the ranking of factors in all groups is significant at the 99 percent confidence level.

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Conclusion

Risk management is done to identify and analyze risks, for easy understanding and effective management (Khalilzadeh et al., 2020), the basis of this model is to recognize issues and evaluate risks and factors that create the possibility of damage and problems for the main process and with knowledge in this field, it is possible to use the correct executive model while avoiding risks (Rahman[1] et al., 2019). Banks are one of the risk-related and effective organizations, and in this regard, this research with an exploratory view and a mixed approach to the evaluation model of the effectiveness of risk management in payment banks. Findings based on semi-structured interviews with experts in this field showed that there are 4 investment components, financial knowledge, risk dimensions and macro factors related to risk management in Iranian banks. Based on this, the most important themes in the investment sector include (specialization, knowing the conditions, knowing the goal, understanding the gap between the current conditions and the target conditions, finding gaps and establishment), in the financial knowledge section including (financial engineering, financial literacy and financial insight), the risk dimension section included (systematic risk and unsystematic risk) and the macro section included (capital adequacy, credit risk and executive-operational dimensions).

[1] Rehman

After this stage, based on the identified themes and sub-themes, a researcher-made questionnaire was designed, the content validity of this questionnaire was proved through the experts and the internal consistency of the test items was measured through Cronbach's alpha. In the modeling section of the identified factors, the results showed that all the identified components have an index and significant effect on the dependent variable, and all paths of the model are significant. This problem was also found in the evaluation of the effectiveness of risk management dimensions in Iranian banks, with emphasis on the role of risk strategy system mechanisms, and all paths of the model were significant. At the end, the ranking of the factors was done, based on the findings, macro factors, risk dimensions, financial knowledge and investment respectively had the greatest impact on risk management in Iranian banks and only in the third and fourth ranks in this sector, investment has won the third rank and financial knowledge has won the fourth rank. Also, according to the results of the Friedman test, the ranking of the factors in all groups was significant.

In explaining the obtained findings in line with other investigated researches; In order to create an effective risk management in Iranian banks, it is necessary to take a multifaceted look at all the effective dimensions in this field and it is necessary to take place on the basis of a structure, dimensions of risk based on the general conditions of the market and society and global conditions, in the context of examining macro policies and agreeing on the basis of these policies. There is also a need to establish a management model with a correct understanding of all aspects involved; a specific executive approach relying on knowledge and a model based on it in the organization. Based on this, the effectiveness of risk management in Iranian banks is a trans-organizational issue, and although organization and management play an important and effective role in the executive policies of an organization in different dimensions but this effectiveness in Iranian banks, in the first step, requires a greater relationship between the organization and the economic conditions of the society than by taking into account the conditions related to the liquidity and inflation pattern and other conditions governing the society's economy from an optimal pattern with measured decisions in coordination with macro factors and to be done internally, and without a doubt, a deep look and understanding of these issues is an important and effective matter in this sector and its related dimensions. Based on this, it is suggested to create permanent working groups in the banking management system in the whole system and in organizational micro-structures in order to monitor the daily conditions and the axes based on it, to use a ground to reduce damages and empower in this field it is also suggested that organizational and micro managers be employed from among those with expertise and experience in the field of financial knowledge in the field of risk dimensions, so that the convergence of expertise and capability can reduce the harms in this area. On the other hand, it is necessary to conduct a qualitative study with the ground approach of the theory of processology of the involved dimensions and the path of formation in this field in order to provide more comprehensive and practical information in this field.

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