Applied-Research Paper

Identify and Rank the Effective Factors of Financial Risks and Efficiency in Insurance Companies Listed on The Stock Exchange Using the Delphi Method

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ABSTRACT

Financial markets play a key role in economic development, and the insurance industry as a financial institution can be the bedrock of economic growth. Thus, risk and performance appraisal are very important in the insurance industry. There are several methods for evaluating risk and efficiency in financial markets, but since the performance of insurance companies is different from other financial institutions for the risk acceptance of other organizations and individuals, it is necessary to rank factors affecting efficiency and risk in insurance companies separately based on the performance of companies prior to focus on the calculation method. This paper discussed factors affecting the financial risks of insurance companies and efficiency and their rankings using the Delphi qualitative method and collecting expert opinions as well as data from domestic and foreign papers. The statistical population of the research is experts and specialists in the field of risk and insurance. SPSS, Eviews and Excell 2013 were used to review the questionnaires and estimate the results. The results of this paper identified the factors affecting each of the risks of financial wealth, liquidity, credit, operations and efficiency, and in the ranking obtained through the Friedman test, efficiency is the highest rank, followed by liquidity, operational and credit risk in the rankings.

1 Introduction

The insurance industry is one of the leading sectors in the capital market in the current world economy. Insurance as one of the effective tools for risk management and providing security and peace of mind, on the one hand, has led to the expansion of social welfare and on the other hand to the growth of investment and consequently, production grows faster and the economy thrives [2]. Meanwhile, all countries have experienced significant challenges within the insurance system during

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the last two decades [26]. Efficiency can be expressed as the concept of how an organization uses its resources for production, relative to the best performance at a point in time, and measuring the efficiency index means calculating the ratio of output outputs obtained from inputs (factors of production) to Is employed. Insurance services play an important role in the national economy and have profound effects on the behavior of various economic sectors. Today, fundamental changes in the world economy and insurance companies have also undergone fundamental changes [33]. Among these fundamental changes are the slight increase in insurance companies and the increasing presence of the private sector in this area of economic activity. So that this presence has grown almost several times compared to previous years [1].

Given the significant role that insurance companies play in economic growth and that their bankruptcy may exert detrimental effects on individuals, businesses and the economy as a whole, assessing the performance, efficacy and risks that these companies face will be effective to eliminate weaknesses and increase their efficiency; subsequently, this paper aims at identifying, reviewing and ranking the effective factors of risks and efficiency in insurance companies [32]. Throughout history, human economic endeavors have always been aimed at maximizing the efficiency of available resources and inputs, and all these endeavors, from the most basic tools to the most advanced technologies of the present age, show the human desire to increase efficiency and productivity [29]. Also, the situation in global markets, limited resources, and intense competition from organizations have led to the adoption of appropriate strategies [27]. As managers and decision-makers of organizations, want to make optimal use of facilities and capacities in different sectors.

Therefore, performance appraisal in order to provide feedback to improve the performance of various branches of organizations and achieve a tool to meet this need of managers seems very necessary and logical [6]. The growth and development of the insurance industry and the provision of better and more quality insurance services require the development of the management structure of insurance companies to establish risk management systems and internal controls and performance appraisal in line with corporate governance and accountability to stakeholders [13]. An appropriate governance structure is a prerequisite for an efficient system of risk management and financial wealth. Risk management is a logical and systematic method for analyzing, evaluating and dealing with risk related to any type of activity that enables organizations to minimize losses while taking advantage of opportunities [3]. The biggest benefit that risk management has for a company is that it generally avoids the occurrence of avoidable accidents and related costs in the area of its asset coverage, and thus contributes to the continuity of business [5]. In fact, risk identification and management lead to more informed decision-making, coherent planning and better use of resources [31]. Obviously, each organization experiences different risks according to the nature of its work, and in today's changing conditions, the success of any firm is basically depending on identifying the factors affecting various risks and mastering the risks and the type of management that applies the types of risks [4]. From a regulatory and insurance perspective, in order to determine the required regulatory capital, five types of major risks can be identified for each insurance company, in accordance with financial risk-based models in the United States, Australia, the European Union, Japan, and the 2002 IAA[1] Standard including, Market Risk, Credit Risk, Liquidity Risk, Operational Risk and Insurance or Underwriting Risk [12]. We must keep in mind that insurance companies will not be able to develop a comprehensive and accurate risk management plan if not properly aware of the factors affecting their financial risks and performance, and they will have to pay far more to manage those created for

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[1] International Actuary Association

neglecting the risk of their activity [9]. Every organization urgently needs to evaluate and measure efficiency to be aware of the desirability and quality of its activities, especially in complex and dynamic environments. On the other hand, the lack of an evaluation and control system in system means not communicating with the internal and external environment of the organization, the consequences of which are aging and ultimately the death of the organization [8].

The phenomenon of organizational death may not be felt by senior managers due to its gradual occurrence, nonetheless, studies show that the absence of a feedback system, and the necessary reforms to grow, develop and improve the activities of the organization, eventually make organizational death investable [11]. Therefore, in this paper, the researcher has identified the factors affecting the financial risks and efficiency of insurance companies and also the ranking of these factors [10]. The effects of efficiency and risk on the performance of companies in the country have not been done simultaneously and in insurance companies whose activities are based on risk have not been done separately or simultaneously, so examine how the effects of financial risks on the performance and performance of companies Insurance is also a new and innovative issue with the simultaneous equations approach. This research, uses the opinion of insurance experts, ranking and presenting a local model in the field of risk of insurance companies using the Delphi method, which is innovative both in terms of subject and method.

2   Literature Review

Insurance activities have well-known differences from other economic activities. This includes asymmetric information in insurance transactions. This information asymmetry leads to moral hazards and adverse selection. Another difference is that the use of insurance (losses) in financial figures can start from very small numbers and lead to much larger numbers than what is paid as a premium [30]. These differences make the nature of insurance companies' risks different from other organizations, which must be examined separately [7].

2.1 Insurance Companies Risk

Risk is an integral part of an organization's strategic management. All activities and opportunities related to new customers, new markets, countries, or new endeavors are inevitably exposed to the various challenges posed by risks [25]. Today, in organizations with financial activities, one of the most important features of organizational maturity is the way the organization looks at identifying and managing related financial risks and factors affecting it, so that in mature organizations, specific and integrated processes are considered for this purpose [14]. According to IAA standards, there are five types of risks identified for insurance companies:1) Operational risk, 2) Liquidity risk, 3) Credit risk, 4) Market risk and 5) Insurance or Underwriting Risk.

The Insurance or Underwriting includes three main categories of risk: a) risk of miscalculation of insurance premiums (risk of routine issuance of insurance), b) risk of insufficient technical reserves (deferred claims reserves) (risk of routine issuance of insurance) and c) risk of any catastrophic event Insurance [18]. The problem of organization and management in insurance companies is very acute in terms of classifying insurance risks, especially in countries where people's purchasing power is low. In Poland, some authors [16]. Point out that expectations for the introduction of insurance management information systems are often unjustified, and that the sale of insurance products often shows quite a surprising trend. The same problems are observed in Eastern European countries by Lee

and Lin [17] examined 30 OECD countries and concluded the same indicator of the effects of globalization in recent years (including Poland, for the effects of its entry into the European Union, Russia after the signing WTO agreements, Southeast Asian socialist countries for economic policy liberalization, etc.). Also in Turkey, there has been a significant structural change in the economic sector of insurance, as shown by [7] through the example of changes in a large insurance company [15]. This shows that successful changes in the risk management system can lead to positive changes in financial dynamics in the face of adverse external influences. Turkey is a special country in terms of life and health insurance features. Medical services in Turkey are very important. Therefore, health insurance, which covers 85% of the population, should not change, but the reality shows that from 2013 to 2016, after-tax profit in the insurance industry due to depreciation in the lira and the decline in market profitability with a relatively stable number of companies in it, has decreased from $ 645 million to $ 92 million [20]. As a result of such external influences, many insurance companies do not survive the competition and do not become profitable [19]. In this situation, improving the management process, especially risk management, is very important for insurance companies [24].

One of the main problems in the management of an insurance company is the problems of financial stability and debt settlement that exist in insurance companies [1]. Therefore, finding factors affecting risk and its management in insurance companies to improve the quality of information and decision support for management seems necessary [21]. In the Iranian insurance industry, the starting point for the establishment of the financial wealth system is Regulation No [23]. 69 of the Supreme Insurance Council, approved on March 16, 2012, entitled the Regulation on how to calculate and monitor the financial wealth of insurance companies. Iran Financial Wealth System, which is a risk-based system, identifies the risks facing insurance companies in 5 groups Insurance or Underwriting, Market, Credit, Operations and Liquidity Risk, and determines separate risks, risk profiles and coefficients per group, thereby calculating the insurance companies required capital [22].

2.2 Study Background

Zegardi et al [19] have proposed a hierarchical structure for project risk assessment in order to increase the probability of project success by identifying and evaluating risk and providing methods for risk avoidance. Risk assessment criteria, their evaluation and weight are determined by the fuzzy network analysis process. Then the risks are classified by the TOPSIS method in a fuzzy environment. This model was implemented in power plant projects. Using the brainstorming method and reviewing the documentation, the risk was identified and the most important risks were assessed. Based on the results obtained, despite the ambiguity and inaccuracy of project risk data, the proposed model is appropriate and applicable to real-world problems.

Soleiman Nasab and Khoshsima [7] used the PROMETEE method to rank the factors affecting risk management in the insurance industry. This was an applied survey. Having reviewed the literature and the field studies, the main variables of risk assessment were extracted and after determining the index, they were ranked using a questionnaire. Data analysis concluded that all elements of risk management affect the quality of risk management and the use of new management methods can improve all elements of risk management. The growth and development of the insurance industry of a country underlie the factors of economic growth and development of the country, and developed countries often have a more developed insurance industry. Until the insurance industry can provide the necessary conditions for a safe and secure presence of domestic and foreign investors in various

sectors of the economy, one cannot expect a country to achieve economic growth and excellence. Therefore, the insurance industry can be considered one of the most important factors in accelerating the growth of the national economy of each country. Thus, it can be easily understood that inefficiency in the insurance industry will not only affect the quality of life, but also hinder the improvement of efficiency in the economic sectors, and this means not achieving the goals of economic development [8]. In recent years, the insurance industry has faced new challenges due to joining the World Trade Organization, such as the entry of strong foreign insurance industries and the increase in the number of domestic insurance companies. Therefore, the insurance industry in the country to survive and compete in this dynamic environment needs to evaluate the correct performance and, if necessary, improve efficiency [20]. Therefore, identifying factors and models that affect performance is very important.

Yazdanpanah and Khalilzadeh [22] in their paper, provided a conceptual framework for monitoring the insurance industry consisting of principles, standards and theoretical and practical guidelines, and attention to the goals of the International Association of Insurance Supervisors (IAIS) to protect insurance rights that are considered to be necessary. Atataleb and Niyakan [21] examined the risk-based monitoring system and examined the experience of countries regarding this regulatory approach. In this study, three risk matrix models, the PAIRS system used in Australia, and the risk severity and probability rating system used in Poland are introduced to measure and score risk. Hsiao [14] used 30 ratios as an independent variable to study the financial rating systems and predict the financial insolvency of life insurance companies in Taiwan. These ratios are mostly FAST[2] and IRIS[3] ratios and a few other rating systems This study also used non-financial ratios such as binary variables. The financial data used were for the period 1998 to 2002. The dependent variable is also assigned based on CAMEL[4] and RBS[5] models. The two methods of neural network and multiple audit analysis were used for modeling.

Sandström [2] examined financial wealth, models, appraisals and regulations and the factors affecting it. This study examined 116 private companies and 17 state-owned companies in Swedish insurance companies for the years 1990-2008. The results of this study showed that calculations for companies with better financial stability show lower required margins, because of less probability of bankruptcy and crisis for these companies. On the other hand, factors such as human capital, the ratio of total debt to assets and the ratio of total investments to total assets, etc. have a significant role in reducing or improving the financial wealth ratio of selected companies. Arif et al [10] examined the relationship between financial risk and financial performance in the Indian insurance industry, in which 24 life insurance companies currently operating in the Indian insurance market were selected as the target population, all of which belong to the private sector. In order to determine the factors affecting financial performance in the Indian insurance market between 2005 and 2013, the explanatory variables in this study are capital management risk, insurance risk, liquidity risk, company size and capital volume. As a dependent variable, the financial performance of insurance companies is measured through the return on assets (ROA). Finally, the results of the multiple regression model showed that capital management risk (financial wealth risk) and liquidity risk have a negative and significant relationship with the financial performance of the insurance company, while liquidity risk, company size and capital volume have a positive and significant relationship with financial

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[2] Financial Analysis Tracking System
[3] Insurance Regulatory in Formation system
[4] Capital Adequacy, Asset Quality, Management, Earnings, Liquidity
[5] Risk-Based Capital

performance. While, underwriting risk, has an insignificant negative impact. Scientific methods of ranking decision-making units are categorized into two categories, quantitative and qualitative. Data Envelopment Analysis (DEA) is a quantitative ranking method. This method has one drawback, and that is that it is a completely mathematical method without considering the factor of the mind. In such a way that it is possible that the most important index does not necessarily have the most weight and, conversely, the least important one gains more weight [19].

In contrast to quantitative ranking methods, there are several qualitative methods including hierarchical process, Delphi, TOPSIS and so on. The general feature of each of them is that the weight of the evaluation index calculated by these methods is based on the experience and opinion of experts and their mental judgment [12]. These methods have the advantage that although they do not correctly define the weight of each index, they effectively define the weighted priority according to the importance of each index and eliminate the conflict between the index weight and the actual size that occurred in the quantitative models [11].
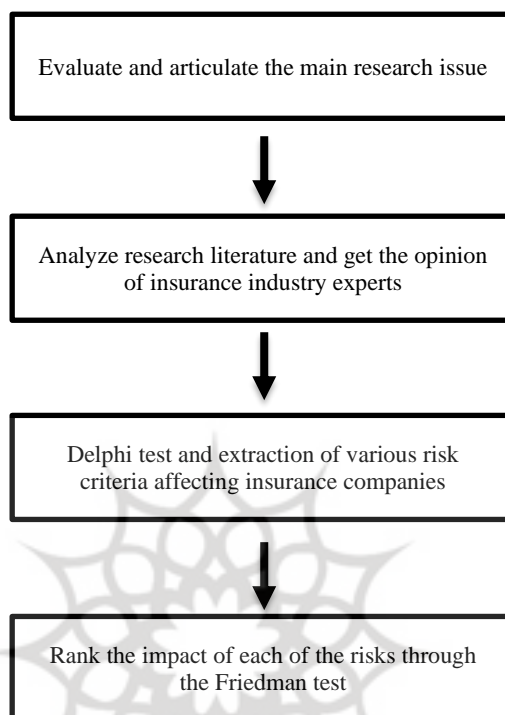
3   Research Method

In this paper, a descriptive research method has been used, because examining the cause and effect of the factors affecting financial risks and efficiency in insurance companies is the main objective of the paper. There are also three research methods according to Croswell's findings: quantitative, qualitative and combined of both methods, that the current paper has used the combined research approach because the use of the combined approach compared to each of the approaches alone is a means to compensate for the inherent weaknesses of each method with the strengths of the other method. In addition, adopting a combined approach in this paper can enable data collection from various methods to achieve more accurate and generalizable results.

Table 1: List of insurance companies in this research

Number	company name	Number	company name
1	Alborz	8	Saman
2	Asia	9	Ma
3	Pasargad	10	Etkaee amin
4	Novin	11	kosar
5	Kosar	12	Etkaee Iranian
6	Parsian	13	Mellat
7	Dey		

Thus, in this paper, the combined research method is started using a quantitative study and the results obtained from this method are examined with a qualitative method to better understand the purpose of this paper, namely to identify and rank the risk factors and efficiency in 13 insurance companies in Iran. Thus, first, the research data are sorted using Excel software and then the respondents are classified in terms of gender, service history and education level and its results. In the following, the final criteria and effective factors are extracted using the opinion of experts. Once the researcher has collected, extracted, and classified the data, a new phase known as data analysis begins. The data analysis step is a multi-step process during which the data provided through the use of collection tools in the statistical sample (population) are summarized, coded and categorized, and finally processed to

prepare grounds for various analyses and relationships between these data to test the research questions. Then, descriptive analysis of demographic data has been done in the descriptive statistics section, and finally, the results of the Delphi technique and ranking of factors are presented. The statistical population of the research is experts and specialists in the field of risk and insurance.

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│   Evaluate and articulate the main research  │
│                   issue                      │
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│   Analyze research literature and get the    │
│     opinion of insurance industry experts    │
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│   Delphi test and extraction of various risk │
│     criteria affecting insurance companies   │
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│   Rank the impact of each of the risks       │
│        through the Friedman test             │
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Fig. 1: Flowchart of Stages and Generalities of Research

3.1 Main Questions

- What are the factors affecting financial and efficiency risks in insurance companies?
- How are financial and performance risks ranking in insurance companies?

3.2 Sub-Questions

4-2-1 What are the factors affecting wealth risk in insurance companies?

4-2-2 What are the factors affecting operational risk in insurance companies?

4-2-3 What are the factors affecting credit risk in insurance companies?

4-2-4 What are the factors affecting liquidity risk in insurance companies?

4-2-5 What are the factors affecting the efficiency of insurance companies?

4-2-6 What is the ranking of wealth, operational, credit, liquidity and efficiency risks in insurance companies?

4 Research Findings

Table 1 shows the work experience of the sample. According to Table 1, 77 percent of the respondents are male with 23 percent female Respondents.

Table 2: Distribution of respondents by gender

Gender	Frequency	Percentage
Male	128	77
Female	38	23
Total	166	100

Table 2 shows the work experience of the sample. According to Table 2, people with work experience between 16 and 25 years have the highest and people with work experience between 1 and 5 have the lowest percentage in the population.

Table 3: Distribution of respondents by work experience

Work experience	Frequency	Percentage
1 to 5 years	20	11
6 to 15 years	47	27
16 to 25 years	59	34
More than 25 years	50	28
Total	166	100

In the Delphi method, the query is performed in two or more rounds, and in each round, the results obtained from the previous round or rounds are used. Therefore, from the second round, specialists and experts will answer the questions under the influence of the ideas and opinions of their peers and the results obtained from the previous round. The Delphi technique is a robust process based on a group communication structure that analyses the information using a questionnaire. For this purpose, the opinions and judgments of individuals are collected on a certain subject. In other words, the judgment is left to the experts. The Delphi method is mainly used to discover creative and reliable ideas or to provide appropriate information for decision-making. This method conducts surveys of individuals in order to examine the attitudes and judgments of individuals and expert groups as well as to establish coordination between views. These surveys are conducted in several stages using a questionnaire and without requiring people to attend a certain place. In the end, summarizing, evaluating and analyzing the set of views and opinions of individuals is used as the basis for goal setting, program development or decision making. The Delphi method can be implemented by the following rounds:

Round 1- Discover the objective,

Round 2: Decide on the structure of the research,

Round 3: Select the participants,

Round 4: Design and distribute the first-round questionnaire,

Round 5: Design and distribute the second-round questionnaire,

Round 6: Design and distribute the third-round questionnaire.

The Five-point Likert Scale was used to answer the items with the options for measuring the importance of each factor; 1. Very low, 2. Low, 3. Moderate 4. High 5. Very high. This questionnaire was pre-tested and sent for a smaller sample that is similar to the target sample before sending it to the selected statistical sample. The questionnaire was designed semi-openly at this stage so that these people could also comment on the factors (this questionnaire is actually the second questionnaire). The correlation coefficient was calculated for each item and the expressions were adjusted with a low correlation coefficient to make the questionnaire more valid in terms of validity. Also, Cronbach's

alpha coefficient of the questionnaire is 0.911, which gives the appropriate reliability of the questionnaire for data collection. The basic structure of the questionnaire for sending via e-mail is a spreadsheet file. Which intelligently responds to the answers provided by the respondents and displays a proportionate response for each option selected. Also, this electronic questionnaire will display an error message if parts of the questionnaire are not completed. This paper uses the Delphi method, in which, with the aim of indirect circulation of knowledge and information among experts, the respondents are provided with the opinions of other respondents in each round anonymously, so that if endorsed by them, modify their initial comments in order to reach a greater consensus on the factors affecting the model. Also, the questionnaire was designed in a semi-open method in the first round so that respondents could comment on the classification of factors and add new factors.

Table 4: Summary of different stages of questionnaire distribution and the result of each stage

Questionnaire	Indices No.	Respondents	No.	Objective	Result
First	34	Experts	30	Delete, combine and adjust the index	Classify, adjust and summarize factors to 29
Second	29	Experts	30	Adjust, prioritiz and classify indices	Minor adjustment in the description of some indices
Third	29	Experts	30	Review the indices for final approval	Final identification of indices

In the first round, the experts were provided with a questionnaire of 34 indices. The purpose of this round is to remove, combine and modify the indices, which has finally reached 29 indices. In the second and third rounds, a questionnaire was distributed to adjust and prioritize the index and classify them. The Delphi First Round Questionnaire consists of two parts, which were delivered to 30-panel members and follow-up to receive their answers began the week after distribution. Thus, each member was contacted by phone an average of 3 times, and 30 questionnaires were received.

4.1 Results of the first round of Delphi

a list of local factors affecting financial risks and efficiency in insurance companies, which was extracted from previous research and theoretical foundations, was presented in the first round of the Delphi questionnaire. In this section, the respondent expressed their opinion about the impact of each of the local factors affecting the financial risks and efficiency of insurance companies, by choosing one of the options available to them. These options were in the form of a Five-point Likert Scale, including "Very Low Impact: 1", "Low Impact: 2", "Moderate Impact: 3", "High Impact: 4", and "Very High Impact: 5". The questionnaire has another part in which the respondent could express his/her opinions and suggestions about each component and index.

In the above table, the final indices of the research, which are designed in the form of a final questionnaire, are sent to the experts for evaluation, and a summary of the experts' opinions is reported in Table 4. Now, the desired indices can be ranked in accordance with the Kendall index. According to the Kendall index, the lower the Kendall index for various criteria, the higher the importance of this criterion in the final model and the better it is evaluated in the criteria. At this round, the indices that are ranked higher are removed.

Table 5: Results of the first round of Delphi method: About local factors affecting Financial Risks and efficiency in insurance companies first round of Delphi

Factor description	Number of answers	Answers mean	Answers SD	Kendall	Order of importance
Wealth risk					
Ratio of engineering, oil and gas premiums to total premiums	30	4.13	0.715	2.15	3
Market share	30	4.18	0.724	2.23	4
Income premium to total production premium	30	4.01	0.742	2.07	1
Reserve ratio	30	4.22	0.629	2.29	5
Size of the company	30	4.09	0.748	2.12	2
Market competition	30	4.28	0.664	2.37	6
Liquidity risk					
Deposit changes	30	4.16	0.825	2.23	2
Exchange rate fluctuations	30	4.24	0.641	2.27	3
Inflation fluctuations	30	4.39	0.932	2.31	4
GDP	30	4.58	0.816	2.41	6
Interest rate fluctuations	30	4.12	0.849	2.16	1
Economic cycles	30	4.44	0.711	2.36	5
Efficacy					
Value of claims paid	30	4.09	0.662	2.18	2
Initial investment	30	4.21	0.767	2.31	5
Time of issuing the insurance policy	30	4.36	0.843	2.44	9
Value of issued insurance policies	30	4.02	0.726	2.16	1
Number of insurance policies issued	30	4.15	0.893	2.22	3
Operational costs	30	4.29	0.716	2.38	7
Number of official personnel	30	4.33	0.839	2.42	8
Number of agencies	30	4.26	0.842	2.36	6
Number of claims paid	30	4.19	0.747	2.28	4
Credit risk					
Variety of collateral	30	4.16	0.816	2.07	1
Diversity of customers	30	4.28	0.619	2.24	4
Sufficiency of collateral	30	4.19	0.622	2.09	2
Variety in maturity	30	4.31	0.739	2.28	5
Penalty rate	30	4.24	0.674	2.14	3
Integrated information system	30	4.33	0.768	2.34	6
Operational risk					
Staff needs assessment	30	4.25	0.636	2.46	7
Planning	30	4.08	0.847	2.27	3
Lack of supervision	30	4.18	0.763	2.41	6
Years of service	30	4.06	0.718	2.24	2
Workforce specialization	30	4.03	0.871	2.18	1
Information Technology	30	4.14	0.667	2.36	5
Work study	30	4.11	0.793	2.31	4

In the above table, the final indices of the research, which are designed in the form of a final questionnaire, are sent to the experts for evaluation, and a summary of the experts' opinions is reported in Table 4. Now, the desired indices can be ranked in accordance with the Kendall index. According to the Kendall index, the lower the Kendall index for various criteria, the higher the importance of this criterion in the final model and the better it is evaluated in the criteria. At this round, the indices that are ranked higher are removed.

4.2 The results of the second round of the Delphi methods

One of the main purposes of using the Delphi method is to eliminate excess criteria, which means that the proposed criteria are summarized to achieve the final model. At this round, after removing the excess indices in the previous Delphi stage, which was done according to the experts' opinion, a questionnaire was sent to the experts for initial approval.

Table 6: Results of the second round of Delphi method

Factor description	Number of answers	Answers mean	Answers SD	Kendall	Order of importance
Wealth risk					
Ratio of engineering, oil and gas premiums to total premiums	30	4.18	0.636	2.43	3
Market share	30	4.29	0.569	2.52	4
Income premium to total production premium	30	4.03	0.552	2.24	1
Reserve ratio	30	4.34	0.448	2.60	5
Size of the company	30	4.16	0.693	2.38	2
Liquidity risk					
Deposit changes	30	4.05	0.863	2.29	2
Exchange rate fluctuations	30	4.13	0.629	2.36	3
Inflation fluctuations	30	4.32	0.528	2.41	4
Interest rate fluctuations	30	4.00	0.931	2.24	1
Economic cycles	30	4.46	0.646	2.48	5
Efficacy					
Value of claims paid	30	4.03	0.664	2.25	2
Initial investment	30	4.18	0.592	2.38	5
Value of issued insurance policies	30	4.01	0.692	2.24	1
Number of insurance policies issued	30	4.11	0.729	2.31	3
Operational costs	30	4.28	0.833	2.42	7
Number of official personnel	30	4.29	0.748	2.45	8
Number of agencies	30	4.23	0.658	2.40	6
Number of claims paid	30	4.16	0.531	2.33	4
Credit risk					
Variety of collateral	30	4.23	0.636	2.20	1
Diversity of customers	30	4.39	0.512	2.31	4
Sufficiency of collateral	30	4.26	0.573	2.24	2

Table 6: Continue

Factor description	Number of answers	Answers mean	Answers SD	Kendall	Order of importance
Penalty rate	30	4.34	0.611	2.29	3
Operational risk					
Planning	30	4.16	0.795	2.26	3
Lack of supervision	30	4.29	0.867	2.36	6
Years of service	30	4.14	0.639	2.23	2
Workforce specialization	30	4.03	0.876	2.16	1
Information Technology	30	4.23	0.748	2.34	5
Work study	30	4.21	0.697	2.28	4

4.3 Results of the third round of Delphi

The third-round questionnaire also included two sections, the survey section and the local factors affecting financial risks and efficiency in insurance companies. The participants in the first round emphasized financial risks and efficiency in insurance companies as local factors.

Table 7: Results of the third round of Delphi method

Factor description	Number of answers	Answers mean	Answers SD	Kendall	Order of importance
Wealth risk					
Ratio of engineering, oil and gas premiums to total premiums	30	4.24	0.616	2.28	3
Market share	30	4.32	0.529	2.34	4
Income premium to total production premium	30	4.03	0.574	2.06	1
Reserve ratio	30	4.37	0.442	2.45	5
Size of the company	30	4.09	0.616	2.19	2
Liquidity risk					
Deposit changes	30	4.14	0.863	2.26	2
Exchange rate fluctuations	30	4.28	0.625	2.31	3
Inflation fluctuations	30	4.33	0.579	2.37	4
Interest rate fluctuations	30	4.03	0.916	2.13	1
Economic cycles	30	4.39	0.628	2.52	5
Efficacy					
Value of claims paid	30	4.06	0.462	2.19	2
Initial investment	30	4.15	0.397	2.34	5
Value of issued insurance policies	30	4.03	0.367	2.16	1
Number of insurance policies issued	30	4.11	0.422	2.22	3
Operational costs	30	4.28	0.383	2.39	7
Number of official personnel	30	4.29	0.425	2.42	8
Number of agencies	30	4.23	0.512	2.36	6
Number of claims paid	30	4.09	0.475	2.28	4
Credit risk					

Table 7: Continue

Factor description	Number of answers	Answers mean	Answers SD	Kendall	Order of importance
Variety of collateral	30	4.00	0.616	2.12	1
Diversity of customers	30	4.33	0.532	2.37	4
Sufficiency of collateral	30	4.26	0.564	2.19	2
Variety in maturity	30	4.48	0.572	2.43	5
Penalty rate	30	4.29	0.685	2.34	3
Operational risk					
Planning	30	4.34	0.716	2.29	3
Lack of supervision	30	4.48	0.823	2.43	6
Years of service	30	4.26	0.612	2.16	2
Workforce specialization	30	4.19	0.895	2.03	1
Information Technology	30	4.39	0.746	2.32	5
Work study	30	4.21	0.674	2.30	4

Given the table above, the results of the second and third rounds of Delphi are completely similar and there is no need to do a new round.

4.4 Test the normality of the items

● Normality test (Kolmogorov-Smirnov) for the wealth risk component

H0: Data is normal (data is from a normal population)

H1: Data is not normal (data did not come from a normal population)

If the value of the significant level is greater than the error value (0.05), we conclude the assumption of zero, and if the value of the significant level is less than the error (0.05), we conclude assumption one.

Table 8: Results of Kolomogorov-Smirnov test for wealth risk component

Variable	Sig	Error value	Hypothesis confirmation	Conclusion
Wealth Risk	0.362	0.05	H0	Normal

Since the significant level value is equal to 0.362 and is greater than the error value (0.05), so we conclude the null hypothesis that the risk component of wealth is normal.

● Normality test (Kolmogorov Smirnov) for liquidity risk component

H0: Data is normal (data is from a normal population)

H1: Data is not normal (data did not come from a normal population)

Table 9: Results of Kolmogorov-Smirnov test for liquidity risk component

Variable	Sig	Error value	Hypothesis confirmation	Conclusion
Liquidity Risk	0.149	0.05	H0	Normal

Since the significant level value is equal to 0.149 and greater than the error value (0.05), so we conclude the null hypothesis that the liquidity risk component is normal.

● Normality test (Kolmogorov-Smirnov) for efficiency component

H0: Data is normal (data is from a normal population)

H1: Data is not normal (data did not come from a normal population)

Table 10: Results of Kolmogorov-Smirnov test for efficiency component

Variable	Sig	Error value	Hypothesis confirmation	Conclusion
Efficacy	0.295	0.05	H0	Normal

Since the significant level value is equal to 0.295 and is greater than the error value (0.05), so we conclude the null hypothesis, ie the efficiency component is normal.

● Normality test (Kolmogorov Smirnov) for credit risk component

H0: Data is normal (data is from a normal population)

H1: Data is not normal (data did not come from a normal population)

Table 11: Results of Kolmogorov-Smirnov test for credit risk component

Variable	Sig	Error value	Hypothesis confirmation	Conclusion
Credit Risk	0.388	0.05	H0	Normal

Since the significant level value is equal to 0.388 and greater than the error value (0.05), we conclude the assumption of zero, i.e. the credit risk component is normal.

● Normality test (Kolmogorov-Smirnov) for operational risk component

H0: Data is normal (data is from a normal population)

H1: Data is not normal (data did not come from a normal population)

Table 12: Results of Kolmogorov-Smirnov test for operational risk component

Variable	Sig	Error value	Hypothesis confirmation	Conclusion
Operational Risk	0.242	0.05	H0	Normal

Since the significant level value is equal to 0.242 and greater than the error value (0.05), so we conclude the assumption of zero, i.e. the component of operational risk is normal. Thus, the answer to the main research question is obtained as described in Table 6, and the affecting factors per index were identified separately for wealth, operational, credit, liquidity and efficiency risks.

4.5 Ranking the factors affecting risk and efficiency

Friedman test was used to rank the factors affecting risk and efficiency, in accordance with the mean scores. In this test, hypotheses H0 and H1 are defined as follows:

H0: $\mu1 = \mu2 = \mu3 = \mu4 = \dots$

H1: At least one of the means is not equal.

If the significance level value is greater than the error value, we conclude the null hypothesis, and if the significance level value is less than the error, we conclude hypothesis one.

Table 13: Significance level value

No.	Chi-square	Degree of Freedom	Error	P	Result
166	133.201	5	0.05	0.000	Confirmed H1

Friedman test is used to rank different factors. According to the null hypothesis and hypothesis one defined for the Friedman test, according to the obtained probability statistic, it can be stated that if the statistical probability value is more than 0.05, the null hypothesis and if the statistical probability is less than 0.05, hypothesis one is accepted. Because the value of the significance level is 0.000 less than the error value of 0.05 for at least one of the factors, the means are not equal to each other, so the factors are ranked in accordance with the rank mean as allowed.

Table 14: Ranking of 5 components affecting efficiency in insurance companies

Rate	Component	Mean rate
1	Efficacy	5.79
2	Wealth risk	5.35
3	Liquidity risk	5.25
4	operational risk	4.47
5	Credit risk	4.35
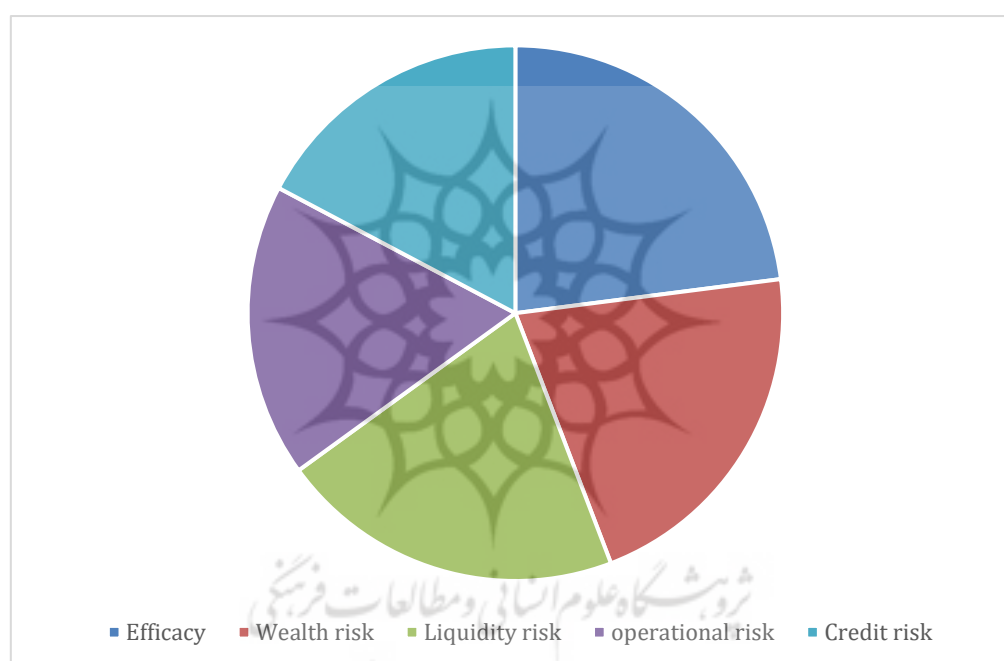
Fig. 2: Efficiency in insurance companies

The Table results show, efficiency with a mean rating of 5.79 has the highest rank in the performance of insurance companies, financial wealth risk with a mean rating of 5.33 is in second place affecting the efficiency of insurance companies and liquidity risk with a mean rating of 5.25, the operational risk with a mean rating of 4.47 and credit risk with a mean rating of 4.35, is ranked next.

5   Conclusion

In this paper, having defined the problem, appropriate input and output factors were determined based on literature and the opinion of experts and the relevant statistics. Then, the key factors affecting the types of financial risks and efficiency of insurance companies were identified and examined using the Delphi method. Then Friedman test was used to rank each of the efficiency and risk factors based on

the impact on the efficiency of insurance companies. The results show that the key factors affecting the financial wealth risk, which is one of the main risks affecting the insurance industry and are seriously considered by international and global organizations, respectively, according to the Kendall index, earned premium to total production premium, company size, the ratio of engineering premiums, oil and gas premiums, etc. to the total premiums, market share and the ratio of reserves. The factors affecting liquidity risk are interest rate fluctuations, deposit changes, exchange rate fluctuations, inflation fluctuations and economic cycles, respectively. Regarding credit risk, the influential factors include the variety of collateral, the adequacy of collateral, the penalty rate, the variety of customers and the variety of maturities, respectively. Factors affecting efficiency include the number of insurance policies issued, the value of claims paid, operating expenses, the value of claims paid, the initial investment, The number of claims paid, the number of the office personnel, and the number of agencies. Finally, the Friedman test was used to rank efficiency, and risk factors on performance were ranked, which showed that the highest rank is efficiency (79.5) and then wealth risk, liquidity risks, and operational and credit risks in the rank, respectively. Research suggestions are presented as follows:

1- Insurance companies can reduce operational risks and design the organization's strategies more optimally by identifying and measuring the factors affecting the monitoring and control of internal processes of the organization and employing specialized personnel at different levels.

2- Insurance organizations can, by evaluating and optimally controlling the factors that create credit risk, liquidity and wealth, establish the preconditions for controlling these factors in the company, and in addition to controlling the bankruptcy of the organization, make it more profitable to their shareholders.

3- The possibility of bankruptcy of insurance companies by considering their financial risks should be examined and a model should be provided in this regard.

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