



Case Study

Investigating Factors Affecting the Financial Wealth of Insurance Companies in Iran

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ABSTRACT

The main goal of this article is to Investigating Factors Affecting the Financial Wealth of Insurance Companies in Iran. The method of this article is descriptive in terms of practical purpose and library data collection method. The data collection tool in this article was a standard questionnaire that was adapted from Masoumi et al.'s questionnaire and model. The statistical population of the research is all the experts in the country's insurance industry. The results of this article showed that the country's insurance industry experts, including university professors and senior managers of Iran Insurance Company, agree with these four main risks in the Financial Wealth model. However, these four main risks are not enough for the model of Financial Wealth. In the final, the optimal pattern of financial wealth in the Iranian insurance company includes four main pillars, which include 6 basic and general contain asset/liability mismatch risk, reinvestment risk, exchange rate risk, international market risk, life insurance account separation risk from non-life insurance account, life insurance account investment risk risks in the insurance industry each of the basic and general risks of the insurance industry also has several risks and sub-categories.

1 Introduction

Today, one of the main concerns of each insurance company is fulfilling the obligations related to the policyholders and maximizing the benefits of the insurance company. [45] For this purpose, the regulatory organizations of each country approve special laws and regulations, and managers adopt precautionary measures and new technical and financial solutions to try to maintain the financial strength of insurance companies at an acceptable level. [35] One of these cases is the use of appropriate

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financial mechanisms that improve the financial evaluation ability of insurance companies. [24] Usually, for sectors such as life insurance that have technical reserves and risks associated with them, insurance companies consider a precautionary reserve per year (2.4 times the need to face adverse financial conditions) to meet the risk capital margin of that insurance. According to Anderson [2], most insurance companies determine their figures with new formulas and it is more responsive than the old formulas. [27] but these new figures cannot help insurance companies much in terms of financial prosperity. The traditional scale of Financial Wealth in sectors such as life insurance has been equal to 2.7% to 9.3% on average. [13], but it still has defects. As we know, in 1973, the European Economic Association published the first wealth guidelines for life and non-life insurance companies for EU countries, which were the first step towards establishing a free market in the insurance industry within the economic community [19].

So the importance of this matter is clear here on the one hand, the Financial Wealth of insurance companies and on the other hand. [20] the accurate and appropriate calculation model in insurance policies can improve the situation of insurance companies in terms of Financial Wealth and obtain high ranks in the central insurance rating. [10] as well as show off their financial strength in the eyes of shareholders and insurers. So in the research topic, data analysis is considered one of the main and most important parts of the article. [11] Raw data is analyzed using statistical techniques and after processing it is provided to users in the form of data [8] In addition to using appropriate statistical techniques in the logical analysis of data, presenting the findings of the article is also of particular importance. [7] Because the findings of the article should be presented in a logical order according to the questions of the article. In this regard, the findings of this article are presented as follows. The findings of this article are presented in two parts, descriptive and inferential statistics. First, the findings obtained through descriptive statistics in this article are presented. These findings are presented in the form of Tables and graphs with the necessary explanations. [37] Financial wealth is a very old concept. The term was first used in the 1630s to mean the payment of legal debts. Before the term financial wealth was introduced, other concepts such as legal reserves were often used. [4] Financial solvency means the ability of an organization or business unit to have sufficient assets to pay its debts. According to the research conducted by the campaign in the field of financial prosperity. [5] He can be considered as the pioneer of financial wealth research. The campaign conducted important research in the late 1940s and developed the Financial Affordability Assessment for non-life insurance [6].

His research in 1957 led to the creation of an approach to evaluate the minimum reserves of life and non-life insurance companies in the European Economic Development and Cooperation Organization. In 1973, the European Economic Association published the first financial guidelines for life and non-life insurance companies for EU countries, which were the first step towards establishing a free market in the insurance industry within the economic community [17].

With the progress of civilization the development of human societies and the application of new sciences and technologies. [14] human wealth and property have increased. Despite the facilities that have been provided for greater prosperity with the introduction of industrial products, new risks have also entered society. [26] which constantly endangers the lives and property of people. Sometimes the harmful effects of these risks are beyond the limits of the person's tolerance and ability, therefore one of the most important thoughts of every person in his personal and social life is to create favorable conditions to secure the future and prevent the consequences of unwanted incidents in order to achieve peace of mind. Today, insurance is considered one of the important pillars of the economic and social life of human societies and a guarantee of economic circulation. [21].

Insurance companies must meet requirements to evaluate their wealth. [25] The National Association of American Insurers introduced the risk-based capital system in 1992 for life insurance companies and in 1993 for non-life insurance companies. In Iran, after the introduction of Financial Wealth II in November 2012, the Central Insurance Company has taken measures for the covered companies, but it has not yet been able to cover all the criteria well. [29] Therefore, it can be said that the best estimate of the insurer's obligations, which is the same as technical reserves, is determined through actuarial calculations of the insurance company's future obligations and based on the risks associated with changes in things such as the interest rate of stocks and the stock exchange, etc. Also According to the existing laws, insurance companies are required to calculate their technical reserves at the end of each financial period within the framework of the approved regulation No. 58 of the Supreme Insurance Council and its subsequent additions under the title "Technical reserves of insurance institutions" and report them in the financial statements. Technical reserves are actually the determining items in the balance sheet and profit and loss account, which are calculated by including the following: technical reserves of insurance premiums. [12] technical reserves of returned insurance premiums, supplementary technical reserves, deferred losses, technical reserves of natural losses, technical reserves for participation in the interests of life insurers, and reserves for actual but unannounced losses. Reserves are a part of liabilities and therefore only items can be identified as reserves that have met the conditions for recognizing liabilities. [36] One of these conditions is the existence of a current obligation to transfer economic benefits. Items that are not a current liability of the insurance company should not be recognized as reserves in the financial statements [16].

2 Theoretical Fundamentals and Research Background

Financial wealth is a very old concept. The term was first used in the 1630s to mean the payment of legal debts. Before the term financial wealth was introduced, other concepts such as legal reserves were often used. Financial solvency means the ability of an organization or business unit to have sufficient assets to pay its debts. According to the research conducted by the campaign in the field of financial prosperity. He can be considered as the pioneer of financial wealth research. The campaign conducted important research in the late 1940s and developed the Financial Affordability Assessment for non-life insurance. His research in 1957 led to the creation of an approach to evaluate the minimum reserves of life and non-life insurance companies in the European Economic Development and Cooperation Organization. In 1973, the European Economic Association published the first financial guidelines for life and non-life insurance companies for EU countries, which were the first step towards establishing a free market in the insurance industry within the economic community. [39] With the progress of civilization, the development of human societies, and the application of new sciences and technologies, human wealth and property have increased. Despite the facilities that have been provided for greater prosperity with the introduction of industrial products, new risks have also entered society, which constantly endanger the lives and property of people. Sometimes the harmful effects of these risks are beyond the limits of the person's tolerance and ability, therefore one of the most important thoughts of every person in his personal and social life is to create favorable conditions to secure the future and prevent the consequences of unwanted incidents in order to achieve peace of mind. Today, insurance is considered one of the important pillars of the economic and social life of human

societies and a guarantee of economic circulation. [38] Insurance companies must meet requirements to evaluate their wealth. The National Association of American Insurers introduced the risk-based capital system in 1992 for life insurance companies and in 1993 for non-life insurance companies. In Iran, after the introduction of Financial Prosperity II in November 2012, the Central Insurance Company has taken measures for the covered companies, but it has not yet been able to cover all the criteria well. Therefore, it can be said that the best estimate of the insurer's obligations, which is the same as technical reserves, is determined through actuarial calculations of the insurance company's future obligations and based on the risks associated with changes in things such as the interest rate of stocks and the stock exchange, etc. Also According to the existing laws, insurance companies are required to calculate their technical reserves at the end of each financial period within the framework of the approved regulation No. 58 of the Supreme Insurance Council and its subsequent additions under the title "Technical reserves of insurance institutions" and report them in the financial statements. Technical reserves are actually the determining items in the balance sheet and profit and loss account, which are calculated by including the following: technical reserves of insurance premiums, technical reserves of returned insurance premiums, supplementary technical reserves, deferred losses, technical reserves of natural losses, mathematical technical reserves, technical reserve for participation in the interests of life insurers and reserve for actual but unannounced losses. Reserves are a part of liabilities and therefore only items can be identified as reserves that have met the conditions for recognizing liabilities. One of these conditions is the existence of a current obligation to transfer economic benefits. Items that are not a current liability of the insurance company should not be recognized as reserves in the financial statements [37].

Chen et al [7] compared different Canadian financial institutions through indicators that represent four main balance sheet risks, including liquidity capital leverage and funding over time. The results show that various risk indicators have decreased during the last three decades. This study, also shows that changing regulations has a significant effect on balance sheet management by financial institutions. These regulations require more risk management on the balance sheet.

Aliqlifar [1] in a research entitled "Proposal of an expanded model for managing financial risks in Iranian insurance companies" stated in the result of his research that considering that nowadays the importance of financial risk management has increased significantly, the management and supervision of all types of Financial risks are of great importance in order to increase financial strength and wealth. Continuous financial risks should be analyzed in such a way that the market value of liabilities and assets are examined simultaneously. For this purpose, the total balance sheet approach is used in the analysis of financial risks. This approach is considered The purpose of this article is to propose a model to identify the II basic title for the financial wealth system exposed to the risks of financial risk, including the effects of exchange rate and interest based on the components of insurance companies' balance sheets for risk management of insurance companies. For this purpose, in this review, the process of calculating the required capital of Tungari has been described. Finally, using scenario analysis, the effects of financial risks II, the basis of the financial wealth system, have been investigated. The results of this research can be used in all insurance companies in Iran.

Majdi [22] in a research named "Introduction of Financial Prosperity II, Risk Management Standard in the Insurance Industry" achieves these results. In order to guarantee the financial ability to fulfill future obligations, the continuity of the business of insurance companies and to protect

the interests of policyholders and shareholders, insurance institutions always seek to use appropriate and practical risk management methods, tools, and standards. Achieving this goal is pursued in the literature under the title of financial wealth, which is one of the important topics in risk management of financial institutions, especially insurance companies. In this regard, a lot of research has been done for a long time, the results of which have been published and used in many countries in the form of different models and standards, which have been implemented in the countries of the European Union since 2012. The Financial Wealth II system is a new system for the insurance industry. This system considers a wider field of risks in the insurance industry. Also, in this system, special attention is paid to the coordination of evaluation methods, monitoring measures, and information clarification that were somewhat neglected in the previous systems, but this system is implemented in the insurance industry and a company like Iran Insurance, which holds about 47% of the insurance market. It cannot be that it causes a contradiction with the global system and even some regulations of the 69th Central Insurance, for which a special model should be designed and implemented.

Hajiha [18] conducted a study on the difference in the understanding of senior auditors in both public and private sectors regarding the assessment of audit risks in Iran's audit environment. The results of his research indicated a significant difference between the understanding of public and private senior auditors about the factors influencing the assessment of control risk and the risk of non-detection. Also, there was no significant difference between these two groups in terms of understanding factors affecting audit risk and inherent risk.

In research, Danielson [9] examined the entire balance sheet in the banking industry using the concept of value at risk, and the strength of the balance sheet depends on the total capital of the bank. In this study, the amount of capital required for market risk and the balance between assets and liabilities are considered in a closed form as functions of the bank's total capital, then the experimental features of the model are examined using the recent experiences of financial crises, and the importance of balance sheet strength as a criterion. It is emphasized for market risks.

Belch [5] in his study identified the financial risk on the balance sheet information of insurance companies. In this study, a sample of data collected from 100 large Polish companies over a 10-year period was examined in order to analyze the effect of changes in market conditions and the general state of the insurance economy on the financial status of companies. The results of this survey have been used in financial planning and forecasting financial risks. In this study, to achieve these results, and to have a more general picture of the country's health, it is necessary to consider other information from the financial statements and the audit system in order to help improve the insurance situation. Therefore, the research questions are as follows:

- 1) Is Insurance risk effective on the Financial Wealth of Iranian insurance companies?
- 2) Is Credit risk effective on the Financial Wealth of Iran's insurance companies?
- 3) Is Market risk effective on the Financial Wealth of Iranian insurance companies?
- 4) Is operational risk effective on the Financial Wealth of Iranian insurance companies?
- 5) Is The risk of domestic insurance regulations and circulars effective on the Financial Wealth of Iran's insurance companies?
- 6) Is Legislation risk, effective on the Financial Wealth of Iran's insurance companies?
- 7) The ranking of factors affecting financial wealth are different from each other?

The findings of some researchers showed that there is a significant relation between the stock market uncertainty changes in an economic boom and the investment risk in general, which is

not significant in terms of the economic turndown. The Investment risk during both economic boom and recession is decreased by the unexpected increase in profit of each share and propagation of positive news. Although the risk is increased by the spread of negative forecasts in relation to shares [40]. Based on other research indicates that there is a positive and significant relationship between institutional investors and passive institutional investors with conservatism. Other findings suggest that cost stickiness has a positive impact on the relationship between institutional investors and passive institutional investors with conservatism [41]. The results of another research show that there is a reverse (negative) relationship between institutional ownership level, managerial ownership level, and ownership concentration level with liquidity. Also, there is a direct (positive) relationship between corporative ownership level and liquidity [42].

3 Methodology

The method of this article is descriptive in terms of practical purpose and library data collection method. The data collection tool in this article was a standard questionnaire that was adapted from Masoumi et al.'s questionnaire and model. The statistical population of the research is all the experts in the country's insurance industry. To analyze the data in this research, the path analysis method was used, and the software used in this research was Lisrel 8.8.

4 Findings

After studying the literature of the article and scientific texts in this field, a questionnaire containing closed questions on the 5-point Likert scale is presented to the experts in order to determine the importance of each factor. The data collection tool in this article was a standard questionnaire that was adapted from Masoumi et al.'s questionnaire. The questionnaire was completed by the experts of insurance companies in Iran and all dimensions of the model were measured and ranked by it.

The assumptions of this research according to the model are:

- 1) Insurance risk is effective on the Financial Wealth of Iranian insurance companies.
- 2) Credit risk is effective on the Financial Wealth of Iran's insurance companies.
- 3) Market risk is effective on the Financial Wealth of Iranian insurance companies.
- 4) operational risk is effective on the Financial Wealth of Iranian insurance companies.
- 5) The risk of domestic insurance regulations and circulars is effective on the Financial Wealth of Iran's insurance companies.
- 6) Legislation risk is effective on the Financial Wealth of Iran's insurance companies.
- 7) The ranking of factors affecting financial wealth are different from each other.

In the presentation of the model, 6 main risks and 20 subcategory risks were considered, which was approved by 82% of votes. One of the constant topics is reaching an agreement

2-exploratory factor analysis

In the development of regression theory, Spearman used the term factor analysis for the first time in his theory of intelligence in 1927. To prepare a valid scale, the factor analysis method can be used to screen the items and select the main items. After creating the set of preliminary variables in the factor analysis, the final set of variables is extracted to make the scale by rotating. Factor analysis by creating a correlation matrix shows that the variables are gathered in clusters so that the variables of each cluster are correlated and not correlated with other clusters. These clusters are the dimensions of the subject under study. The variables of each cluster are the measurement items of that dimension. Variables that have no correlation with other variables should be removed because the variables under analysis should have

a reasonable correlation with some other variables of the analysis.

Exploratory analysis is used when the researcher does not have enough previous and pre-experimental evidence to form a hypothesis about the number of factors underlying the data and really wants to explore the data to determine the number or nature of the factors that justify the covariance between the variables. Therefore, exploratory analysis is considered more as a theory formulation and generation method and not a theory testing method.

Table 1: Results of Main Risks and Subcategory Risks in Model

main risks	the risk of the subset of indicators	factor load	maximum	minimum	the standard deviation	number of the average	indicators
Insurance risk	Insurance operation risk	0.6	5	2	0.415	4.660	RB1
	Biological risks	0.8	5	3	0.707	4.000	RB2
	Termination and redemption risk	0.73	5	3	0.533	4.496	RB3
	Cost risk/ cost	0.81	5	3	0.640	4.559	RB4
	Risk of risk escalation	0.95	5	3	0.707	4.627	RB5
	Risk of non-technical manpower	0.83	5	3	0.123	4.140	RB6
Credit risk	Credit default risk	0.94	5	3	0.428	4.154	RA1
	Concentration risk	0.63	5	4	0.553	4.471	RA2
	Reliance contract risk	0.78	5	2	0.664	4.701	RA3
Market risk Asset	Asset/liability mismatch risk	0.80	5	2	0.415	4.774	RM1
	Reinvestment risk	0.65	5	3	0.487	4.379	RM2
	Exchange rate risk	0.59	5	2	0.857	4.774	RM3
	Risk of international markets	0.70	5	3	0.455	4.832	RM4
	Risk of separation of life insurance account from non-life insurance	0.62	5	3	0.354	4.105	RM5
	Life insurance account investment risk	0.73	5	3	0.707	4.627	RM6
operational risk	Risk of inability to control and manage	0.81	5	4	0.493	4.140	RP1
	Risk of human errors	0.95	5	3	0.428	4.154	RP2
	Fraud risk	0.71	5	4	0.553	4.471	RP3
	Judicial and legal risk	0.94	5	2	0.664	4.701	RP4
	The risk of not having proper expert equipment and damage assessment	0.81	5	2	0.748	4.143	RP5

1-Exploratory factor analysis related to insurance risk components

In the component related to insurance risk in the financial wealth model (II), 6 subcategories or non-criteria risks were identified and extracted. For each of these indicators, a question was formulated and distributed among the statistical population in the form of a questionnaire. The results obtained from the analysis of the exploratory factor related to insurance risk in the financial wealth model (II) are described in Table (2). According to Table (2), the value of the extracted share for all the risks of the subcategory is more than 0.5, so all the risks are not excluded from the review process. Therefore, for the insurance risk in the financial wealth model (II), 6 indicators have been recognized as having appropriate validity and reliability and will be used in future calculations.

Table 2: The Matrix of Rotated Factors with Principal Component Analysis Method and Varimax Rotation Method (Insurance Risk)

the factors related to insurance risks	questions	variance of the coefficients	amount of explanation	significance	KMO
indices	Row	76.86	0.776	0.000	0.895
Risk of insurance operations	1		0.694		
biological risks	2		0.849		
Termination and redemption risk	3		0.795		
risk of expenses/cost	4		0.846		
risk of risk escalation	5		0.674		
non-technical manpower risk	6		0.465		

According to Table (2), the value of the extracted share for all the risks of the subcategory is more than 0.5, so all the risks are not excluded from the review process. Therefore, for the insurance risk in the financial wealth model (II), 6 indicators have been recognized as having appropriate validity and reliability and will be used in future calculations.

Exploratory factor analysis related to credit risk components

In the component related to credit risk in the financial wealth model (II), 3 subcategory risks or sub-criteria were identified and extracted. For each of these indicators, a question was formulated and distributed among the statistical population in the form of a questionnaire. The results obtained from the analysis of the exploratory factor related to the credit risk in the financial wealth model (II) are described in Table (3).

Table 3: The Matrix of Factors Rotated by Principal Component Analysis and Varimax Rotation Method (Credibility Risk)

the factors related to insurance risks	questions	variance of the coefficients	amount of explanation	significance	KMO
indices	Row	78.01	0.868	0.000	0.802
Credit default risk	1		0.771		
concentration risk	2		0.806		
risk of reliance contract	3		0.779		

According to Table (3), the value of the extracted share for all the risks of the subcategory is more than 0.5, so all the risks are not removed from the review process. Therefore, for the credit risk in the financial wealth model (II), 3 indicators with appropriate validity and reliability were recognized and are used in future calculations.

exploratory factor analysis of questions related to market risk components

In the component related to market risk in the financial wealth model (II), 6 subcategory risks or sub-criteria were identified and extracted. For each of these indicators, a question was formulated and distributed among the statistical population in the form of a questionnaire. The results obtained from the analysis of the exploratory factor related to market risk in the financial wealth model (II) are described in Table (4). According to Table (4), the value of the extracted share for all the risks of the subcategory is more than 0.5, so all the risks are not excluded from the review process. Therefore, for the market risk in the financial wealth model (II), 6 indicators with appropriate validity and reliability were recognized and are used in future calculations.

Table 4: The Matrix of Rotated Factors with Principal Component Analysis Method and Varimax Rotation Method (Market Risk)

the factors related to insurance risks	questions	variance of the coefficients	amount of explanation	significance	KMO
indices	Row	76.86	0.776	0.000	0.895
Risk of asset/liability non-compliance	1		0.716		
reinvestment risk	2		0.629		
exchange rate risk	3		0.574		
international markets risk	4		0.631		
Risk of separation of life and non-life insurance accounts	5		0.640		
Life insurance account investment risk	6		0.757		

Exploratory factor analysis of questions related to operational risk components

In the component related to operational risk in the Financial Wealth model (II), 5 subcategory risks or sub-criteria were identified and extracted. For each of these indicators, a question was formulated and distributed among the statistical population in the form of a questionnaire. The results obtained from the analysis of the exploratory factor related to operational risk in the financial wealth model (II) are described in Table (5).

Table 5: The Matrix of Rotated Factors with Principal Component Analysis Method and Varimax Rotation Method (Operation Risk)

the factors related to insurance risks	Q	variance of the coefficients	amount of explanation	SIG	KMO
indices	Row	76.86	0.776	0.000	0.895
Risk of asset/liability non-compliance	1		0.716		
reinvestment risk	2		0.629		
exchange rate risk	3		0.574		
international markets risk	4		0.631		
Risk of separation of life and non-life insurance accounts	5		0.640		
Life insurance account investment risk	6		0.757		

According to Table (5), the value of the extracted share for all the risks of the subcategory is more than 0.5, so all the risks are not removed from the review process. Therefore, for the operational risk in the financial wealth model (II), 5 indicators were recognized as having appropriate validity and reliability and they will be used in future calculations.

5- Exploratory factor analysis of questions related to the risk components of internal insurance regulations

In the component part related to the risk of internal insurance regulations and circulars in the financial wealth model (II), 3 sub-category risks or sub-criteria were identified and extracted. The results obtained from the analysis of the exploratory factor related to the risk of internal insurance regulations and circulars in the financial wealth model (II) are described in Table (6). According to Table (6), the

value of the extracted share for all the risks of the subcategory is more than 0.5, so all the risks are not excluded from the review process. Therefore, for the risk of internal insurance regulations and circulars in the financial wealth model (II), 3 indicators with appropriate validity and reliability were recognized and will be used in future calculations.

Table 6: The Matrix of Rotated Factors with Principal Component Analysis Method and Varimax Rotation Method (Regulation Risk)

the factors related to insurance risks	questions	variance of the coefficients	amount of explanation	significance	KMO
indices	Row	68.55	0.823	0.000	0.892
Risk of interference of internal regulations before and after	1		0.868		
risk of ignoring instructions	2		0.849		
The risk of reducing the importance of regulations over time	3		0.731		

exploratory factor analysis of questions related to legislative risk components.

In the component section related to legislative risk in the Financial Wealth model (II), 5 subcategory risks or sub-criteria were identified and extracted. For each of these indicators, a question was formulated and distributed among the statistical population in the form of a questionnaire. The results obtained from the analysis of the exploratory factor related to legislative risk in the financial wealth model (II) are described in Table (7).

Table 7: The Matrix of Rotated Factors with Principal Component Analysis Method and Varimax Rotation Method (Legislative Risk)

the factors related to insurance risks	questions	variance of the coefficients	amount of explanation	significance	KMO
indices	Row	73.825	0.812	0.000	0.836
Risk of traditional and old laws	1		0.674		
The risk of not following the rules with the conditions of the day	2		0.720		
Risk of legal restrictions in setting tariffs	3		0.715		
risk of ignoring the rules	4		0.824		

According to Table (7), the value of the extracted share for all the risks of the subcategory is more than 0.5, so all the risks are not removed from the review process. Therefore, for the legislative risk in the financial wealth model (II), 5 indicators with appropriate validity and reliability were recognized and will be used in future calculations.

Confirmatory factor analysis

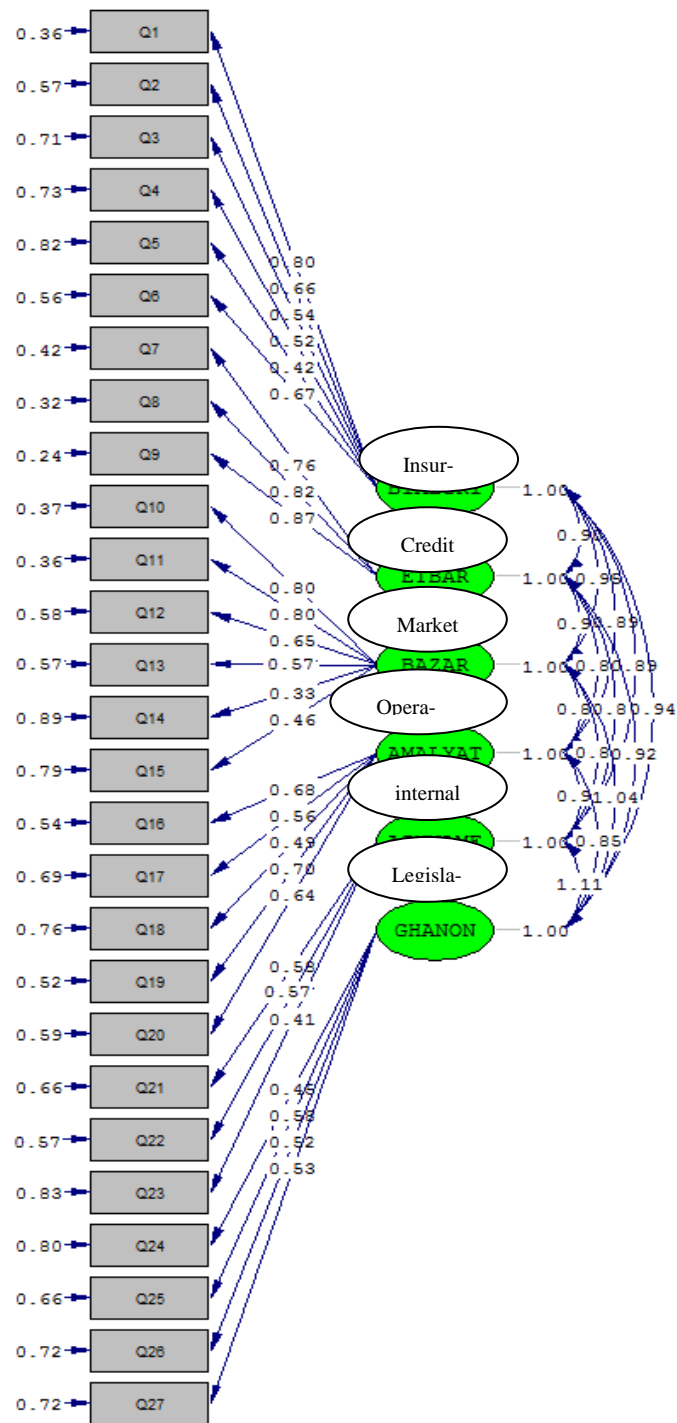
At first, factor analysis was merely an exploratory statistical method. But recently, it has become possible to test hypotheses using factor analysis. This method, invented by Kog, is called confirmatory analysis. In this method, based on previous studies or according to the discussed theory, factor loadings are assumed for the variables, then confirmatory factor analysis is performed to fit the loadings of the target matrix as accurately as possible. The measurement model specifies how latent variables (exogenous and endogenous) are related to or measured through observable variables. In other words, the

specific characteristics of the measurement (i.e., reliability and validity coefficients) are how the observed variables are described by the underlying variables. In this article, to check validity, content validity, face validity, and construct validity are evaluated. Content validity ensures that the scale contains enough items and examples to use the concept. The more items representing the concept area being measured, the higher its content validity. In other words, content validity represents how to describe the dimensions and components of the concept [22]. In order to design the questionnaire, considering the strong background of the models and also keeping in mind the variables of the main models, it was tried to rely on the appropriate support of the theory and their practical applications in numerous articles and tests in terms of the indicators that measure the structures. Symbolic validity shows the items that are expected to measure a concept, they measure the concept and seem to measure the concepts. [23] Face validity actually examines whether the experts confirm that the instrument measures what its name implies. In order to measure the symbolic validity, the questionnaire and its content were reviewed by respected professors and advisors, and their corrective comments were taken into account. Construct validity refers to how the results are obtained from the application of the scale that is intended for the hypothesis test. This work is evaluated with convergent and discriminant validity. [19] In order to analyze the internal structure of the questionnaire and discover the constituent factors of each construct, construct validity was performed using the confirmatory factor analysis tool. Confirmatory factor analysis of the article's structures is presented in the form of the following charts to check the dimensions of the article's variables. The results indicate the confirmation of the construct validity of variables and dimensions of the model. In other words, the validity of the questionnaire structure is confirmed and it can be used to collect data.

Confirmatory factor analysis of risk components of financial wealth model (II)

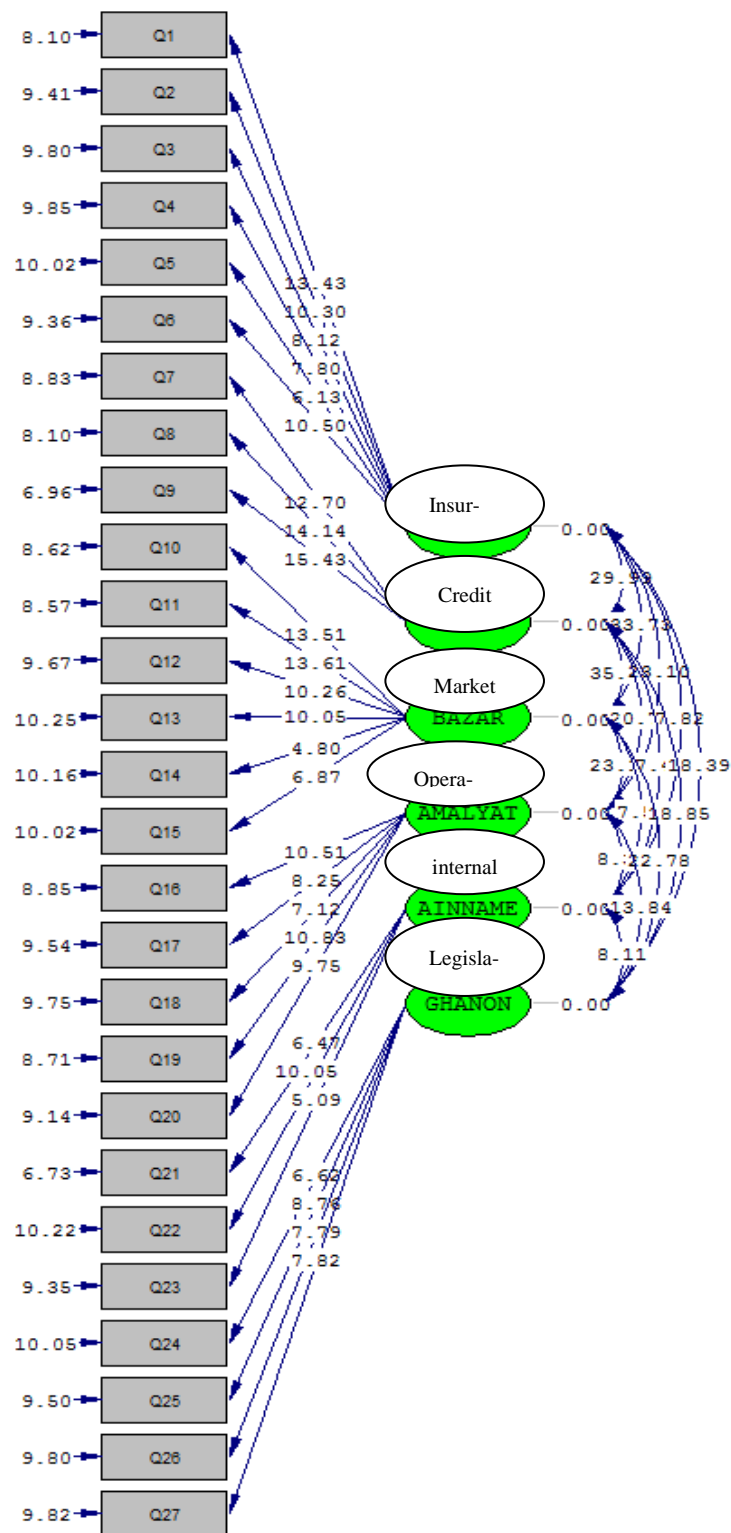
Confirmatory factor analysis examines the relationship between items (questionnaire questions) and constructs. In fact, until it is proven that the questions of the questionnaire have measured the hidden variables well, the hypotheses of the article cannot be used based on the data of the questionnaire. Therefore, confirmatory factor analysis is used to prove that the data are measured correctly. The strength of the relationship between the factor (latent variable) and the observable variable is indicated by the factor loading. Factor load is a value between zero and one. If the factor load is less than 0.2, the relationship is considered weak and is ignored. A factor loading between 0.2 and 0.6 is acceptable, and if it is greater than 0.6, it is very desirable [1]. The minimum acceptable factor load is also mentioned in some sources and references as 0.2, but the main criterion for judging is the t statistic. If the test statistic i.e. t-statistic is greater than the critical value of $t_{0.05}$ i.e. 1.96, then the observed factor loading is significant (for example, refer to Applied Management Statistics, Adel Azar and Mansour Momeni, II). The results of the factor analysis of the financial wealth model are presented in figures (1) and (2). 6 hidden variables and 27 visible variables were used for measurement. The observation factor load in all cases has a value greater than 0.3, which shows that the correlation between the hidden variables (dimensions of each of the main constructs) with the observable variables is acceptable. After the correlation of the variables has been identified, a significance test should be performed. To check the significance of the relationship between the variables, the t-value statistic is used. Because significance is checked at the error level of 0.05, so if the t-value test statistic is greater than the critical value of 1.96, the relationship is significant. Based on the results of the measurement indices of each of the scales used at the 5% confidence level, the t-value statistic is greater than 1.96, which shows that the observed correlations are significant. To check the significance of the relationship between the variables, the t-value statistic is used. Because significance is checked at the error level of 0.05, so if the t-value test

statistic is greater than the critical value of 1.96, the relationship is significant. Based on the results of the measurement indices of each of the scales used at the 5% confidence level, the t-value statistic is greater than 1.96, which shows that the observed correlations are significant.



Chi-Square=579.09, df=309, P-value=0.00000, RMSEA=0.065

Fig. 1: The Results of Confirmatory Factor Analysis and Standard Factor Loading of the Dimensions of the Financial Wealth Model



Chi-Square=579.09, df=309, P-value=0.00000, RMSEA=0.065

Fig. 2: T-Value Statistics of the Dimensions of the Financial Wealth Model

The next step is the goodness of fit of the model. One of the general indices to take into account the free parameters in the calculation of the fit indices is the normal chi-square index, which is calculated by simply dividing the chi-square by the degree of freedom of the model. If this value is between 1 and 5, it is desirable. [2] In this article, the standard chi-square of 1.87 was obtained, which is less than the criterion value of 3. Also, the RMSEA index is used as a main fit index in most confirmatory factor analyses and structural equation models. If this index is smaller than 0.08, it is desirable. In the saturated model of this article, the RMSEA index equal to 0.065 was obtained, which shows that the fit of the model is good. Hierarchical AHP analysis. In line with the methodology of the article, in order to identify, select, and rank the components of Factors Affecting the Financial Wealth of Iran Insurance Company, the face-to-face interview method was used with experts through the design, completion, and analysis of paired comparison questionnaires. The design of the questionnaire and the selection of criteria and sub-criteria were done using the opinions of the designer and analyst group, including the essay writer, and supervisors, and relying on past experiences. In line with the methodology of the article, a pairwise comparison questionnaire prepared based on preliminary studies contained a list of the most important risks in the insurance industry, which was given to 31 university professors, managers, and experts of the Iranian insurance company. Considering that the aim of the article was to present the Factors Affecting the Financial Wealth of Iran Insurance Company, therefore, AHP hierarchical analysis method was used to prioritize the most important factors. Identifying the risk components of the financial wealth model (II).

In the following, for simulation, we examine the presented algorithm on a problem that can be generalized to any other similar problem to identify and prioritize the risks of Factors Affecting the Financial Wealth in the Iranian insurance company, with any type of index and sub-index. The main and final goal, which is to identify and prioritize the influential components in the optimal model of Financial Wealth in the Iranian insurance company, is placed. In order to select the effective criteria with uncertainty in Factors Affecting the Financial Wealth in Iran Insurance Company, 6 main risks were identified, and 27 subgroups risks were examined, and these factors.

2- Determining the weight of the risks of the financial wealth model (II)

The binary comparison of the ranking of the components influencing the optimal pattern of Financial Wealth in Iran Insurance Company, which includes 6 main risks, is performed based on the hourly quantitative scale and in the same order as used in the Analytical Hierarchy Process (AHP). The result of the binary comparison of the main influencing factors (options) as well as the resulting weighted vector is presented below. To achieve the desired result, group judgment can be used for the binary comparison of the main influential factors, in which case the elements of the binary comparison matrix of the factors will be obtained from the geometric mean of group opinions. Table (8) is also a matrix that specifies the influence of each factor on another factor.

Table 8: The Initial Matrix of Pairwise Comparison of the Main Risks of the Financial Wealth Model

Main Risks	R1	R1	R1	R1	R1	R1
R1	1	5	1/2	5	3	4
R2	1/5	1	1/7	4	1/4	1/2
R3	2	7	1	8	1	2
R4	5/1	1/4	1/8	1	1/5	1/6
R5	1/3	4	1	5	1	2
R6	1/4	2	1/2	6	1/2	1

- Determining the final weights of financial wealth model risks

At this stage, the final weights of each factor and the evaluation criteria of each factor separately and in the total components are specified, as well as their ranking. For this purpose, the weight of each factor is multiplied by the weights obtained for the subgroup criteria of that factor and considered for each criterion. The results are presented in Table (9).

Table 9: The Final Weights of Each Risk and Its Subgroup Risks in The Financial Wealth Model

rank	financial wealth model The main risks	weight of each risk
1	insurance risk	0.288
5	Biological risks	0.062
2	Termination and redemption risk	0.308
6	Cost risk/expenditure	0.030
3	The risk of risk escalation	0.193
4	Risk of non-technical manpower	0.119

- The final ranking of financial wealth model risks

The final weights obtained for the components affecting the optimal pattern of Financial Wealth in Iran Insurance Company are in the form. Also, the ranking of these factors can be The final weights of each risk and its subgroup risks in the financial wealth model

Insurance risk 0.288 1

Credit risk 0.0625

Market risk 0.308 2







Operational risk 0.030 6

The risk of internal insurance regulations and circulars 0.193 3

Legislative risk 0.119 4

Inconsistency = 0.0031 with 0 missing judgments.

Table 10: The Final Result

Graphic	Alternatives	Normal	Ranking
	Insurance risk	0.288	1
	Credit risk	0.062	5
	Market risk	0.308	2
	Operational risk	0.030	6
	The risk of regulations	0.193	3
	Legislative risk	0.119	4

The ranking of each risk and its subcategory risks in the Financial Wealth model. The results and findings of each article are considered the lifeblood and the most important part of the article, to open a way to improvement and excellence with the benchmark findings and the solidity of its hypotheses. The suggestions from the article also call us to change and renew "the most immutable principle of material life". The current article is undoubtedly an example of the usual article that is very opposed to not very agree so that if all the meaningful stratifications and stratifications in the sample are moved, the acceptable form of the article will be maintained. In the first chapter, the generalities of the article include the description of the topic and the context of the article, the questions that the researcher is looking for

answers to, the goals and history of the research, the hypotheses of the article, the uses and benefits of the article, the research method, the data collection tool, the statistical population, and the temporal and spatial scope of the research. The second chapter is the review of the subject literature, in this chapter, the factors of knowledge management strategies and the performance factors of new product development have been examined in the research of previous articles. In the next section, a single sample test and structural equation model have been done by LISREL statistical software. Also, AHP hierarchical analysis has been used in the ranking and presentation of the optimal model.

The content of this chapter is dedicated to the results and findings of the article, the final research model, research limitations, and practical suggestions and suggestions for future research.

5 Discussion and Conclusions

Considering that the qualitative model of this research was presented by the researcher Masoumi and others, therefore, in this research, the researcher is looking for the factors affecting financial prosperity in Iranian insurance companies, therefore, the qualitative part of that research was used, and the model of that research obtained after distributing the questionnaire. The model for the main risks of the financial wealth model of Iran Insurance Companies also includes 6 main risks, each of which has a share in the optimal model. This share is based on the importance and priority of that risk:

The final financial wealth model (π) has risks as follows:

- 1) Insurance risk
- 2) Credit risk
- 3) Market risk
- 4) Operational risk
- 5) The risk of internal insurance regulations and circulars
- 6) Legislative risk

Also, the collected data were analyzed using the AHP hierarchical analysis method. In this analysis, the 6 main risks of the financial wealth model were compared and ranked based on the defined indicators. The results show that insurance risk ranks first among other risks and operational risk ranks last. The ranking results showed that the insurance risks for insurance companies should be considered first, then the market risks should be taken into account. In the next source, they should consider the legislative risks and plan their strategies in such a way that The company does not face problems. The next step should be considering operational risks, then two other dimensions should be considered for insurance companies so that these companies can increase their wealth.

Results and Discussion consists of:

Considering that the results of the article showed that the model of financial wealth has six main risks, therefore the following suggestions are presented to reduce the overall risk of the insurance company:

- For this purpose, insurance operations and processes can be updated with the help of technology and parallel processes can be eliminated.
- The provisions of insurance contracts should be reviewed and the items that lead to an increase in the risk of cancellation and redemption should be removed or modified in the provisions of the contract.
- Codified and periodical training programs for personnel at different levels of the organization should be planned and implemented in order to reduce the risk of non-technical human resources by increasing the skills of employees.
- Domestic insurance regulations and circulars should be revised.

- Appropriate equipment for expert and damage assessment should be provided for the company's personnel.
- Internal regulations should be made and published in a new format.
- Prevent human errors by inspecting and evaluating employees' performance.
- To reduce the risk of fraud, periodic and regular inspections should be carried out.

The limitations of the article are those factors that create obstacles in the way of collecting information, analyzing, and obtaining the desired results. Limitations are inherent in every article. This article is not exempt from this principle and has the following limitations.

Problems of determining the index and converting qualitative categories into quantitative values.

Lack of familiarity of Iranian insurance managers and experts with the paired comparison questionnaire and making the required preferences. The results of this research are in line with the results of Aliqlifar [1] Also, the results of this research are in line with the research results of Chen and others (2024). In this research, it is mentioned that different Canadian financial institutions were compared over time through indicators that represent the four main risks of the balance sheet, including leverage, capital, liquidity, and financing. The results show that various risk indicators have decreased during the last three decades. This study, also shows that changing regulations has a significant effect on balance sheet management by financial institutions. These regulations require more risk management on the balance sheet. Suggestions for future work consist of:

1. Identifying factors affecting the success of financial wealth patterns
2. Evaluating the performance of the financial model using the risks in the processes
3. Identifying the critical success factors of small and medium companies in reducing financial risk.

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References

- [1] Aliqlifar, Z., Ghorbani, R., selling insurance in the style of sales cards, *Gostar coverage.Iran*, 2015; 54. Doi: 10.1201/98564736. (in Persian).
- [2] Anderson, D., Anderson, L. A., Beyond change management: How to achieve breakthrough results through conscious change leadership, *John Wiley and Son*. 2010; (36).
- [3] Bagherabadi, S., Reserves in insurance companies, *article in the magazine: Accountant (series 306)*, 2016;121.
- [4] Brown, A., Demystifying the Risk Margin: Theory, Practice and Regulation, *Staple Inn Actuarial Society*, 2016; 39-40.
- [5] Błach, J., Financial risk identification based on the balance sheet information, *Managing and Modelling of Financial Risks*, 2020; (21): 10-19. Doi: 10.1202/5646765
- [6] Chime, A., Providing a model for predicting the financial prosperity of insurance companies based on early warning indicators, *The 28th Insurance and Development Conference*, 2023; 54. Doi: 10.1201/878675778

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- [7] Chen, D. X., Damar, H. E., Soubra, H., Terajima, Y., An analysis of indicators of balance-sheet risks at Canadian financial institutions, *Bank of Canada Review*, 2024; (12): 21-33.
- [8] (CEA) Sandstrom, A., *Solvency: models, assessment and regulation*, Chapman and Hall/CRC.2005; Doi: 10.1201/9781420034882
- [9] Danielsson, J., Song Shin, H., and Zigrand, J., Balance, P., sheet capacity and endogenous risk, *Auditing and Finance*, 2011; 321.
- [10] Dosti, A., Saeidi, A., Yoshinari, M., Governing by partnership: the role of Abdolhossein Nikpour and the Chambers of Commerce in Iran's national economy, *Middle Eastern Studies*, 2016; 59(1): 85-102. Doi: 1080/00263206.2022.2043851
- [11] Eulerich, M., Georgi, C., Schmidt, A., Continuous auditing and risk-based audit planning an empirical analysis, *Journal of Emerging technologies in Accounting*, 2020; 17(2): 141-155. Doi: 10.2308/JETA-2020-004
- [12] Farzin, A., the computational model of the financial solvency of insurance, *Auditing and Finance*, 2015; 25. (in Persian).
- [13] General Chairman's report to the General Assembly on the performance of the insurance and central insurance industry in J.A, *Iran Central Insurance*, 2015; 12-20.
- [14] Gholipourfereydooni, S., soultani, R., Designing and Explaining the Model of Brand Experience with the Citizenship Behavior of Customers in the Banking Industry, *Journal of System Management*, 2023; Doi: 1001.1.23222301.2023.9.3.14.7. (in Persian).
- [15] Hosseinabadi, M., Musakhani, M., Presenting a Conceptual Framework in the Entrepreneurial Strategic Factors of Government Managers (Managers of Isfahan Province), *Journal of System Management*, 2023; 13. Doi: 30495/jsm.2022.1972003.1705. (in Persian).
- [16] Khshnoud, Z., Khavansari, R., key guidelines for liquidity risk management, monetary and banking code article, *RBI*, 2012;13-285. (in Persian).
- [17] Hezarvand, E., Abbasi, M., An investigation of job satisfaction organizational commitment and turnover intention in Iranian insurance industry (*Doctoral dissertation, University Teknologi Malaysia*), 2013; 122.
- [18] Hajiha, Z., An Investigation On the Relationship Between Inherent and Control Risks in Risk Based Audit Approach, *Financial Accounting*, 2019; 6(2): 95–120. (in Persian).
- [19] Jafari, A., Identifying the Dimensions and Components of the Perceptual Cognitive Model of Investors with Regard to the Information Environment of the Iranian Capital Market, *Journal of System Management*, 2022; 32. Doi:10.30495/jsm.2023.1972755.1712. (in Persian).
- [20] Kwon, W. J., Wolfrom, L., Analytical tools for the insurance market and macro-prudential surveillance, *OECD Journal: Financial Market Trends*, 2016; 2(1): 1-47. Doi:10.22056/ijir.2017.01.03
- [21] Masoumi, S., Khodayari. M., Javid, D., Identifying Optimal Models of Financial Wealth and Mathematical Requirements of Reserves Based On Risks in Iran, *Journal of System Management shiraz. university*, 2024; 8.

- [22] Majdi, Z., Fatima, N., Institutional Setup of Market Economy and Property Rights in Islam, Building an Islamic Case for Open Markets, 2019; 78-4. (in Persian).
- [23] Matiei, A., Ismailzadeh, A., The relationship between wealth and financial variables of insurance companies, "Insurance Journal" article (125 series), 2016; 1(1):49. Doi: 10.1257/aer.91.3.351
- [24] Mehrabian, J., selling insurance by sales insurance method, marketing, *Poshesh Gostar*, 2015; 99-101.
- [25] Modaresi, Y., Seyed Naghavi, M. A., Roodsaz, H., Raeesi Vanani, I., Designing a Conceptual Framework for the Soft Components of Digital Transformation Using Thematic Analysis, *Journal of Human Resource Management*, 2023; 13(1): 57-88. Doi:10.2203 4/jhrs.2023.172970. (in Persian).
- [26] Picarjo, K., Presenting the model of early warning system of financial wealth of insurance companies using composite data (panel) case study: Iranian insurance companies, *Scientific Research Quarterly Journal of Investment Knowledge*, 2023; 11.
- [27] Rahimi Bagh, A., Mansour, A., study of the impact of requirements of accounting standard 28 on risk management of insurance companies, *18th National Conference and 4th International Conference on Insurance and Development*, 2010; 202. (in Persian).
- [28] Rais Dana, F., actuarial accounting, article in the publication: *Transportation Industry Auditing and Finance*, 2010; 329.
- [29] Saadi, A., *risk and capital management*, Arad Kitab, 2020; 44-48. (in Persian).
- [30] Shirzadi, N., investigating the relationship between profit volatility and financial prosperity in companies listed on the Tehran Stock Exchange according to Altman's model, *Auditing and Finance*, 2016; 22. Doi: 1001.1.28211960.1401.1.2.6.0. (in Persian).
- [31] Sadeghi, A., Nabavi C., Seyyed A., conference paper on the study of the relationship between risks in the financial wealth model of the central insurance of J.A, *the first national industrial management conference*, 2015; 48. Doi: 10.3390/jrfm13010012. (in Persian).
- [32] Solgi, L., Asadi, M. Z., Mohamadian, E., Phenomenology in Geomorphology, *Geography and Development*, 2019; 17(54):1-14. (in Persian).
- [33] Schwarcz, D., Schwarcz, S. L., Regulating systemic risk in insurance, *The University of Chicago Law Review*, 2014; 1569-1640. Doi: 10.1008/s13387-020-00345
- [34] Scherer, M., Stahl, G., The standard formula of Solvency II: a critical discussion, *European Actuarial Journal*, 2021; 11: 3-20. Doi: 10.1007/s13385-020-00252-Z
- [35] Sarlak, A., Khabbazkar, M., Investigating the relationship among information asymmetry, dividend policy and ownership structure, *AMFA*, 2023; 46-49. Doi: 10.22034/amfa.2022.1953564.1709.
- [36] Turkestani, M., Ghanbrund, H., a pathological look at monitoring the financial solvency of insurance com-

panies in Iran with a comparative approach, *conference paper: International Conference on Insurance and Development*, 2014; 28. Doi: 57007420180107. (in Persian).

[37] Talebnia, Gh., Kordloei, H., Introduction of New Risk Metric using Kernel Density Estimation Via Linear Diffusion, *AMFA*, 2022; 87. Doi: 10.22034/Amfa.2020.1896210.1397.

[38] Yaghoubi Farani, A., Karimi, S., Izadi, N., Ataei, P., Effect of virtual social networks on entrepreneurial behaviour of agriculture students in Iran, *Applied economics*, 2019; 51(21): 2326-2335. Doi: 10.1080/00036846.2018.1543940. (in Persian).

[39] Younesi, N., Fadaei, M., Selecting the Optimal Multi-Period Stock Portfolio with Different Time Horizons in the Credibility Theory Framework, *AMFA*, 2023; 32-37. Doi: 10.22034/amfa.2022.1953564.1709.

[40] Zanjirdar, M., Moslehi Araghi, M., The impact of changes in uncertainty, unexpected earning of each share and positive or negative forecast of profit per share in different economic condition, *Quarterly Journal of Fiscal and Economic Policies*, 2016; 4(13): 55-76.

[41] Mohamadi, M., Zanjirdar, M., On The Relationship Between Different Types of Institutional Owners and Accounting Conservatism with Cost Stickiness, *Journal of Management Accounting and Auditing Knowledge*, 2018; 7(28): 201-214

[42] Nekounam, J., Zanjirdar, M., Davoodi Nasr, M., Study of relationship between ownership structure liquidity of stocks of companies accepted in Tehran Stock Exchange, *Indian Journal of Science and Technology*, 2012; 5(6): 2840-2845