



Identifying and Ranking the Factors and Strategies Affecting the Use of Financial Derivative Contract in Risk Management

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ABSTRACT

The present study aimed to identify and rank the factors and strategies affecting financial derivative contracts in risk management. In order to achieve the objectives of the research using the non-random judgment method, the opinions of 15 experts in the field of risk management and derivative contract in the Tehran Stock Exchange and investment companies, up to the stage of theoretical saturation, were used. The present study uses the mixed exploratory research method in two parts: qualitative and quantitative. In the qualitative section, open coding was performed first using open, grounded theory and line-by-line analysis of the interviews. During the coding, 55 items were obtained as basic concepts from the text of the interviews, which were classified into 11 subcategories and three main categories, including underlying factors, intervenors, and strategies. In the quantitative part of the research, experts' views were collected through the questionnaire. Then, the data were determined using a fuzzy hierarchical process, analysis, and prioritization of components in each of the main categories. The results showed that structural and technical factors have the highest priority among the underlying factors; legal factors have the highest priority among the intervention factors. Also, the establishment of a stability council between the financial institutions of Iran (Central Bank, Central Insurance, and Capital Market) has the highest priority among the strategies.

Keywords:

Derivative Contract, Risk Management, Financial Markets.

1. Introduction

The most important components of financial systems are financial markets, financial instruments, infrastructure, financial institutions, the central bank, and a supervisory body (Mohammadi, 2017). Among these components, the present study focuses on financial instruments and derivative instruments. Financial derivative contracts are financial instruments based on a significant asset, such as securities issued, fixed, and valued, and are effective instruments for reducing risk (Grima et al., 2020). The primary role of a derivative contract is to provide a cheap way to cover the risk. Derivative contracts are one of the basic needs of investors and managers in the capital market. They can cover the risk of their portfolio to price fluctuations. This function is essential to encourage foreign investors to invest in a highly volatile country (Mohammadi, 2017). These functions have become the source of very significant transactions of these instruments in reputable stock exchanges. In addition, no capital market without sufficient tools can be considered a developed capital market because investors without sufficient tools can not take advantage of all market opportunities. One of the characteristics of a developed capital market is the variety of financial instruments traded in these markets (Mohammadi, 2017).

On the other hand, one of the areas in which financial engineering operates is securities innovation. Innovation in securities have led to new financial instruments such as futures, options, and invasions. Because these securities derive their value from their underlying assets, they are known as derivative contracts. Essential assets can also include financial assets (such as stock index, stocks) and physical assets (such as gold coins, copper, iron, agricultural products, etc.) (Shahmoradi Khordeh Bolagh, 2017).

In the last two decades, several studies and studies have examined the use and abuse of derivative contracts from different angles using similar or different methods and dealing with financial and non-financial companies. Some researchers date the beginning of derivative contract and derivative contract markets (e.g., Nance et al., 1993; Mian, 1996). Other studies have stated the lessons learned from significant financial losses and some bankruptcies due to improper use of derivative contracts (e.g., Geczy et al., 1997; Bodnar et al., 1995). Some have relied on surveys or interviews

conducted and focused on the same or different aspects of using derivative contracts in different countries or continents (e.g., Bodnar & Gebhardt, 1999; Nguyen & Faff, 2002; Hallahan et al., 2004). A review of the research background shows that various theoretical and empirical frameworks related to derivative contracts and risk coverage have been presented in the literature. However, there isn't a comprehensive study that identifies the factors and strategies affecting the use of financial derivative contracts in risk management. Research in this area has only dealt with some practical components in using financial derivative contracts to manage risk. Different priorities are considered for examining these factors anywhere in the world according to the prevailing conditions in that country. Therefore, to carefully analyze experts' opinions and consider the fundamental considerations in Iran, the present study has identified and ranked the factors and strategies affecting the use of financial derivative contracts to manage risk. First, the theoretical foundations and background of related research will be mentioned in the following. Then, the research method, including the type of research, society, and selecting participants, are stated. In the end, after presenting the research findings, research suggestions are presented.

2. Theoretical Framework

Today, risk has become so widespread that some people believe that all the problems small and large enterprises face are nothing but risks (Bandaly et al., 2018). The concept of risk as a difference in performance is widely used in financial and economic affairs (Valaskova et al., 2018). Meanwhile, risk management is one of the critical goals of companies operating globally. Risk management is a tool that enables the decision-maker to obtain information about an event with destructive effects and, through risk analysis, to make events more definite and gain more control over them; hence, it is an objective and measurable existence that combines the probability of an adverse event and the magnitude of its consequences (Zekos, 2021). It is also apparent that decision-makers seek to invest with minimal risk or reduce and transfer it to achieve a good level of return (Huan & Parbonetti, 2019).

In simple situations where stocks and bonds are the only tradable financial instruments, the only risk available is limited to changes in market value and the

probability of default. But the reality is that we live in a complex world where stocks and bonds are not the only tools available to investors (Li, 2018). Traders, not speculators, looking for their actual needs in the market and worried about rising or falling prices use risk minimization tools, derivative contracts. Investors can adjust the risk level and return of their portfolio in various ways with the help of these tools created by financial engineering, which are typically subdivided into speculators, futures contracts, forward contracts, options, and swaps (Li, 2018). It is a common misconception that derivative contracts are an asset in themselves if this is a misconception because a derivative instrument alone cannot have value or create value. In other words, financial derivative contracts are financial instruments whose prices or values are derived from the prices of other financial instruments or underlying financial assets. Assets that can be used as essential assets in these instruments. These include stocks, interest-rate instruments affected by interest rate fluctuations, foreign exchange market instruments, types of goods, specific and particular credits, and small and large loans (Li & Marinich, 2014). In this regard, the following applications can be enumerated for derivative contracts (Sandra, 2021):

- To control, change, avoid, reduce, eliminate, or effectively manage different types of risks by covering and insuring against them;
- They act as barometers of future price trends, which in turn leads to price correction in the cash market;
- Increase liquidity and reduce transaction costs in the market for fixed assets;
- Enable individual investors as well as institutional investors to design strategies for appropriate asset allocation and portfolio management;
- The derivative contract market reduces the price range and integrates the price structure in different periods. This facilitates the process of diversity and encourages competition.

While derivative contracts, as mentioned above, play a positive role in the capital market and the economy in general, their widespread presence in the market may also have potentially negative consequences, raising concerns about ability, sensitivity, and efficiency. Create the whole economy and financial system. These concerns fall into negative consequences and derivative abuse (Dodd, 2008).

Negative consequences act as a threat to market credibility and price information. Because of the declining market efficiency due to distorted market prices or the threat of deviation, capital costs in these markets are higher. There is always less confidence in financial markets and such commodities. The second category is the misuse of derivative contracts, which can cause the following problems:

- Frauds and manipulations in the market;
- tax evasion;
- Manipulation of information related to the balance of payments;
- Manipulation of company income or balance sheet;
- Expectations for the devaluation of a country's currency (Dodd, 2008).

This type of misuse of the derivative contracts increases systemic and contagious risks. It allows them to become a trigger for the crisis in the financial system, which is a threat to the stability of the financial economy. In addition to the above, the existence of poorly regulated and poorly structured derivative markets leads to new risks, new levels of risk, and new sensitivities that affect the entire economy (Stiglitz & Ocampo, 2008).

The proliferation of derivative contracts and markets, coupled with the constant news of derivative contract' gains and losses over the past decades, has given rise to significant public debate about the benefits, risks, proper control, and regulation of these financial instruments. Legislators, regulators, investors, and stakeholders have expressed concern about the risks these financial instruments may cover or pose to individual companies, specific markets, and the overall economy (Grima et al., 2020). These fears and hopes persist as long as there is no understanding of the whole issue. At present, the risk of investments is very diverse, and there are many more investors in the market than in the past. Due to the infancy of this financial innovation in Iran, capital market decision-makers should behave as concerned as parents and watch their toddlers, and never let their eyes deviate from their path.

3. Research Background

In the last two decades, several studies and studies have examined the use and abuse of derivative contracts from different angles using similar or different methods and dealing with financial and non-

financial companies. Studies describe the history of derivative contracts and derivative contract markets (e.g., Nance et al., 1993; Mian, 1996). Other studies cite lessons learned from significant financial losses and some bankruptcies due to improper use of derivative contracts (e.g., Geczy et al., 1997; Bodnar et al., 1995). Some have relied on surveys or interviews conducted and focused on the same or different aspects of using derivative contracts in different countries or continents (e.g., Bodnar & Gebhardt, 1999; Nguyen & Faff, 2002; Hallahan et al., 2004). However, they have contributed to the growing knowledge and literature on the safe use of derivative contracts. Some of these studies are listed and summarized below:

Zitkiene et al. (2020) conducted a study entitled *Assessing the Impact of Derivative contract on Early Systemic Risk in the Eurozone*. The results show that the correlation fluctuates between the weak-strong level when analyzing the relationship between various financial derivative contracts and the primary systematic risk in the euro area. The results of linear regression analysis also proved that the group of independent variables of financial derivative contract (connection, size, liquidity, complexity, stability, financial leverage) could be used to estimate the dependent variable (primary systematic risk). Bae & Kwon (2020), in a study entitled *Operational and Financial Risk with Financial Derivative contract during the Global Financial Crisis*, examined whether firms adequately protect values against sudden changes in conversion rates using the financial derivative contract. He compared Korean companies that have experienced significant changes in exchange rates in the face of the global financial crisis. The findings show that companies use more derivative contracts to hedge risk during the financial crisis. Grima et al. (2016) conducted a study entitled *Derivative abuse: considerations for internal control*. This study identifies the main sources of abuse of derivatives that increase the risk of using the tool, including poor tool design and classification, ease of blaming derivatives, simple players, inadequate monitoring environment, poor internal controls, Inadequate communication, poor company culture, etc. It also provides a comprehensive analysis of key recommendations for internal control for knowledge of derivative design, human aspects, regulations, communications, knowledge, and training. Proper internal controls can prevent further sabotage without

adding further restrictions to the market. In addition, it provides important internal control recommendations to ensure better companies governance using derivatives. Issazadeh Larzjani et al. (2018), in a study entitled *Risk Management Strategy in Markets and New Financial Products*, stated that innovations and innovations made in the markets along with the development of information technology and globalization of the economy, the world financial markets with It has undergone significant changes and fluctuations and has paved the way for the application of risk engineering as a process of designing innovative financial products, and reducing various types of risks through financial engineering. This study deals with the concepts of risk and its types the relationship between risks in financial engineering and financial management in financial markets. It offers suggestions in the form of results. Bayat et al. (2016) conducted a study entitled *investigating the reasons for non-acceptance and dissemination of innovation in Islamic financial instruments in the Iranian capital market*. After reviewing a summary of the literature on the promotion and dissemination of financial innovations, emphasizing new Islamic financial instruments, this study deals with the dissemination process of Islamic financial innovations in the Iranian capital market. After focusing on classifying barriers to promotion and dissemination of new instruments. Islamic Finance in the Iranian capital market and provides some relevant examples, based on the literature on the acceptance of innovations, the author's field experiences, how to consider the jurisprudential approach, and Sharia view on the structure, components, and effects of a new financial instrument in the capital market. Nazarpour and Haghighi (2014), in a study entitled *Risk Management of Istisna bonds Using the financial instrument of the transaction option*, they proved the hypothesis that the derivative contract of the transaction option is a suitable tool for managing the risk of istisna bonds and concludes that the transaction option contract can be used to manage the risk of istisna bonds. In such a way, the risks of inflation and rate of return in all types of Istisna bonds can be managed by using the option to buy and sell and the risks of non-liquidity, credit, and reinvestment in ordinary and reverse convertible bonds of Istisna using the right of sale. Jalali and Bahrami Nasab (2012), in a study entitled *Using Financial Derivative Contract to Cover Risk*, using the library method while

explaining the derivative contract, examined the role of these instruments in risk coverage. Thus, based on the previous literature, in the first part, the types of derivative contracts, in the second part, the types of risks, and in the third part, the role of derivative contracts in risk coverage were described. Finally, in the fourth section, the experiences of successful countries regarding the use of derivative contracts in risk coverage were mentioned. Khozin and Dankoob (2011), in a study, the factors affecting the use of derivative contracts in the Iranian financial market have been studied. They have been ranked and prioritized using a fuzzy hierarchical analysis process. In this study, the factors were measured in four groups, which are essentially based on the results, including legal factors, structural and technical factors, jurisprudential factors, and factors related to investors.

This section discussed the literature on derivative contracts and their applications. A review of the research background shows that various theoretical and experimental frameworks related to derivative contracts and risk coverage tools have been presented in the literature. However, no comprehensive combination model still examines the phenomenon, so the present study will explore ideas and perspectives to design a strategic model for using financial derivative contracts in risk management.

Considering that in the research done in this field, only some of the practical components in using financial derivative contract tools for risk management have been dealt with, and different priorities for examining these factors in any part of the world according to the prevailing conditions. That country is considered, and also due to the lack of research and the need to research with a multidimensional view of this field in Iran, the present study aims to identify the underlying and interfering factors in the use of a financial derivative contract for management Risk as well as identify related strategies and answer the following key questions:

- What are the practical components (underlying and intervening) in using financial derivative contracts to manage risk?
- What are the strategies for using financial derivative contracts to manage risk?
- How important are each practical components in using the financial derivative contract to manage risk?

4. Research Method

The present study is applied in terms of purpose; In terms of inference method, it is descriptive, and in terms of data nature, it is exploratory. The research population in the present study consisted of experts in risk management and derivative contract in the Tehran Stock Exchange and investment companies. These people are experts in the field of research. The method of selecting participants in the present study is judgmental (review by members of the research team). Accordingly, the criteria for selecting experts in this research are:

- Having a relevant job position or at least five years of experience in the field of risk management and use of derivative contracts
- Having a book, thesis, or at least two valid scientific articles in the field of risk management, derivative contracts, or having a university education related to research fields

Due to the sampling method's nature, the sample size of this study was determined to be 15 people based on available and willing experts. Since in the exploratory mixed research method, first qualitative research methods are used, and then quantitative research methods are used, the steps of the present research have been done as follows:

Qualitative section: The content analysis method was used to collect data and information for qualitative section analysis. Necessary measures were taken for a qualitative interview with 15 experts in risk management and derivative contract in the Tehran Stock Exchange Organization and investment companies that had sufficient knowledge of the subject. In the qualitative stage of the research, data collection continued until theoretical saturation of categories and, more precisely, to the extent that it was no longer possible to access new data. After conducting the interviews, primary and secondary coding was done in Atlas.T software.

Quantitative section: Due to the purpose and nature of the research topic, the most appropriate method in the quantitative stage for the present study was the descriptive-survey research method and, therefore, to obtain the views of experts on identifying and ranking factors and strategies affecting the use of financial derivative contract In order to manage risk, this method was used. A valid questionnaire was used to collect quantitative data in this part of the research. The questionnaire was designed based on the

dimensions and components extracted from the content analysis process. For quantitative data analysis, the Fuzzy Analytic Hierarchy Process (FAHP) method was used to rank the factors and strategies affecting the use of financial derivative contracts in risk management. The process of hierarchical analysis is a way to break down a complex situation into its parts and arrange these parts or variables according to the hierarchical order:

Step 1. Creating pairs of comparison tables and answering based on the verbal spectrum

In this step, like the AHP method, pairwise comparisons must be created, and these pairwise comparisons must be answered based on the following fuzzy spectrum. This 9-digit spectrum is fuzzy AHP. Of course, 5-digit or 7-digit spectra can be used, but this 9-digit spectrum is standard.

Table 1. Verbal expressions used and corresponding fuzzy numbers in fuzzy AHP

The fuzzy equivalent of priorities			Verbal expressions	Code
Upper limit (u)	Middle limit (m)	Lower limit (l)		
1	1	1	Equal importance	1
3	2	1	The same to relatively important	2
4	3	2	Relatively important	3
5	4	3	Relatively crucial to very important	4
9	5	4	Very important	5
7	6	5	Very important to very much important	6
8	7	6	Very much important	7
9	8	7	Very much important to absolutely important	8
10	9	8	Important	9

Step 2. Calculate the incompatibility rate of pairwise comparisons:

In this step, the incompatibility rate of pairwise comparisons should be checked, and if this rate is less than 0.1, it means that the pairwise comparison has appropriate stability and compatibility.

Whenever the condition of equilibrium is met in the matrix of comparative comparisons, that is, we have for all the elements of matrix A:

$$A = [a_{ij}] \rightarrow i, j = 1, 2, \dots, n$$

$$\forall i, j, k = 1, \dots, n \quad \therefore a_{ij} = a_{ik} \times a_{kj}$$

The matrix is then called compatible. We denote the compatible matrix by Ac. In general, suppose w_1, w_2, \dots, w_n contains n weights for the criteria. In this case, the compatible matrix is defined according to the violation condition as follows:

$$W = \begin{bmatrix} \frac{w_1}{w_1} & \frac{w_1}{w_2} & \dots & \frac{w_1}{w_n} \\ \frac{w_2}{w_1} & \frac{w_2}{w_2} & \dots & \frac{w_2}{w_n} \\ \frac{w_3}{w_1} & \frac{w_3}{w_2} & \dots & \frac{w_3}{w_n} \\ \vdots & \vdots & \ddots & \vdots \\ \frac{w_n}{w_1} & \frac{w_n}{w_2} & \dots & \frac{w_n}{w_n} \end{bmatrix}$$

So if A is a compatible matrix, then for every i and j, we have: $a_{ij} = w_i / w_j$

If the violation condition is not met for all components, then the matrix is incompatible, and the incompatibility rate can be calculated by a measure called the incompatibility rate. Because compatibility and incompatibility are important in multifunctional issues, the existence of a technique that can comment on the compatibility and incompatibility of any decision is of great importance. One of the important advantages of the hierarchical analysis process is measuring and controlling the compatibility of each matrix and decision. In other words, in the process of hierarchical analysis, one can always calculate the degree of consistency of the decision and judge whether it is good or bad or acceptable or rejected.

Step 3. Integrate pairwise comparisons:

When multiple respondents have responded to pairwise comparisons, the geometric mean method integrates them. To obtain an integrated paired comparison matrix. The integration of fuzzy matrices is such that we take the first equations of all comparisons together with the geometric mean, the second equations with each other, and the third equations with the geometric mean.

Step 4. Calculate the weights with the Chang development analysis method:

First, based on the following equation, we obtain the values of S_i for each row of the fuzzy pairwise comparison matrix.

$$S_j = \sum_{j=1}^m M_{g^j}^j \otimes \left[\sum_{i=1}^n \sum_{j=1}^m M_{g^i}^j \right]^{-1} \quad (2)$$

Then, based on the following equation, we obtain the magnitude (degree of preference) of each S_i and S_k .

$$V(S_i > S_k) = \begin{cases} 1 & M_i \geq m_k \\ 0 & l_k \geq u_i \\ \frac{l_k - u_i}{(m_i - u_i) - (m_k - l_k)} & \text{otherwise} \end{cases} \quad (3)$$

The raw weights are calculated using the average weight's relation by dividing each raw weight by the total raw weights in the last step.

$$\begin{aligned} V(S \geq S_1, S_2, \dots, S_k) &= (V(S \geq S_1), (S \\ &\geq S_2), \dots, (S, S_k)) \\ &= \min(V(S \geq S_1), (S \geq S_2), \dots, (S, S_k)) \quad (4) \\ &= \min V(S \geq S_i) \quad i = 1, 2, \dots, k \end{aligned}$$

5. Findings

As mentioned in the research methodology section, after a thorough review of theoretical and experimental foundations, semi-structured interview and content analysis approaches were used in the qualitative part of the research to identify factors and strategies affecting the use of financial derivative contracts in risk management. For this purpose, the following steps were performed:

- One week before the interviews, the research proposal (proposal) and a summary of the

theoretical and experimental background were explained to the research team (supervisor, consultant, and two automotive experts), and then they were asked to comment.

- The interview form was first designed to collect the data obtained from the interview. Notes were taken, and conversations were recorded to record people's views.
- Primary analyses of the events gave the interviewees feedback and confirmed that the analyses reflect their assumptions and views.
- After collecting the data obtained from the interview, analyzing and summarizing the qualitative data began. These data were summarized and coded according to the grounded theory method. Thus, the interviews were coded in two primary and secondary coding levels after implementing the interviews. In the first stage, coding is considered primary due to its generality and openness. In the next stage of this type of coding, secondary coding was performed in which the primary codes became a concept code due to a large number of similar categories or the same secondary codes. During the coding, 55 items were obtained as basic concepts from the text of the interviews, which were classified into 11 subcategories and three main categories.
- A summary of the findings was provided to the interviewees, and the analyzes were validated. All respondents stated that they had a good understanding of its components and components.

The following are the results of this part of the research, in Table 2:

Table 2. Analysis of interviews

Basic concepts extracted from interviews (Numbers in parentheses indicate repetition of concepts in interviews)	Primary coding (Subcategories)	Secondary coding (Main Categories)
Coverage of risk, speculation, and reduction of financing costs (3); The benefits of derivative contracts outweigh their shortcomings (5); Derivative contracts are not inherently bad financial instruments (7); Personal greed encourages the misuse of derivative contract Taxation, market manipulation, income, balance sheet, etc.) (2); Misuse of derivative contract causes the investor to go bankrupt, not the derivative contract themselves (4); Understanding the risks associated with derivative contract (5)	Perception	Underlying factors
Better assessment of various risks (4); Tolerance of higher levels of risk (7); Understanding of complex derivative products (5)	Expertise and skills	
Past experiences as the way for the present and the future (4); Better understanding	Experience	

Basic concepts extracted from interviews (Numbers in parentheses indicate repetition of concepts in interviews)	Primary coding (Subcategories)	Secondary coding (Main Categories)
of the direct relationship between benefits or investment and risks (3); Reducing investor fears of possible risks (2); Tolerance of recessions (6); Better risk analysis Existing (4); more sensible investment decisions (2)		
Weakness of technical infrastructures related to derivative instruments (5); Newness of structures related to modern financial instruments in the country (6); Lack of prominent specialists in designing and localization of derivative instruments in the country (4); Complexity of pricing calculations Derivative contract tools (3)	Structural and technical factors	
Non-compliance of some financial instruments with Shari'a rulings (5); Few financial instruments in line with Shari'a rulings (2); Lack of familiarity of financial experts with jurisprudential issues (6); Lack of familiarity of jurists with new financial instruments (4)	Jurisprudential factors	
Lack of compliance and updating of laws with the needs of the day (4); Lack of awareness of legislators and executives on various aspects of the derivative contract (6); Little legal protection of investors (4); Lack of effective rules related to internal controls (3)	Legal factors	Intervention factors
The relationship between parallel financial markets (7); the impact of intra-derivative contract instruments (4); the impact of market risk on the target market of cash flow in favorable conditions and economic crisis (3); Abroad (8)	Inter-market factors	
Using the capabilities of public media for inclusive education. (5); Implementation of public education programs to familiarize the public with the benefits and capabilities of derivative tools (8); Implementation of advanced education programs to increase the awareness of policymakers, legislators, and religious experts (2); Implementation of programs Advanced training to train experienced professionals (4); effective use of the benefits of membership in international institutions and cooperation with foreign exchange for the development of technical knowledge and development of derivative contract (7)	Development of financial knowledge in the field of derivatives and spreading the culture of using them	
Amendment and revision of existing regulations and formulation of new regulations (5); Control and development of information technology applications (3); Development and implementation of principles of accountability and transparency in interaction with stakeholders (4); Development of strategies for interaction with accepted publishers and presentation of mechanisms New for supervising publishers and promoting internal control (2); reviewing laws and adapting organizational structures to current changes (4); redesigning and updating trading rules; and introducing new trading mechanisms (3)	Use effective regulations and procedures to prevent the misuse of derivatives and maintain market health.	Strategies
Establishment of joint trading systems and procedures with regional and Islamic stock exchanges in the field of derivative contract (4); Development of collective investments and encouraging investors to invest indirectly in the derivative contract market through the establishment and development of capital funds. Joint investment (6); Designing new financial instruments and new trading mechanisms (3); Upgrading the trading system and expanding access to this market (2); Organizing and increasing the efficiency of regional forums to attract potential investors and Reduce operating costs (4); planning to increase the presence of foreign investors (2)	Diversify the creation and use of derivatives to attract investors with different tastes and risk-taking capacities	
Integrated supervision over the entire financial system of the country (8); Identification and control of risks in the entire financial system of the country (4); Increasing economic equity in the country's financial markets (3); Creating a balance between financial markets (5); Island decisions, uncoordinated and quirky (7); making convergent decisions and creating a sense of stability of decision-making in investors (4)	Establishment of a Stability Council between financial institutions (central bank, central insurance, and capital market)	

Then, in order to calculate the importance of each of the factors and strategies affecting the use of financial derivative contract in risk management, based on the Fuzzy Analytic Hierarchy Process (FAHP) method, first the geometric mean of pairwise comparison scores of components in each of the main categories Based on the views of 15 experts in the field of risk

management and derivative contract in the Tehran Stock Exchange and investment companies, was obtained and then through the steps of the process of fuzzy hierarchical analysis (FAHP), which was expressed in the research method, the importance of the components It was calculated that the results are presented in Tables (3 to 5):

Table 3: Pairwise comparison and determining the degree of importance of the underlying factors

Underlying conditions	Perception			Expertise and skills			Experience			Jurisprudential factors			Legal factors		
Perception	1	1	1	0.5743	0.8905	1.2654	0.6015	0.7460	0.9548	0.5743	0.8905	1.2654	0.6015	0.7460	0.9548
Expertise and skills	0.7902	1.1230	1.7411	1	1	1	0.8027	1.1487	1.5518	0.6015	0.7460	0.9548	0.6015	0.7460	0.9548
Experience	1.0473	1.3404	1.6625	0.6444	0.8706	1.2457	1	1	1	0.5989	0.7579	1.0760	0.6015	0.7460	0.9548
Jurisprudential factors	0.7902	1.1230	1.7411	1.0473	1.3404	1.6625	0.9294	1.3195	1.6698	1	1	1	0.5989	0.7579	1.0760
Structural and technical factors	1.0473	1.3404	1.6625	1.0473	1.3404	1.6625	1.0473	1.3404	1.6625	0.9294	1.3195	1.6698	1	1	1

The fuzzy sum of each row			Fuzzy synthetic extent			Degree of preference Si over Sk				Degree of preference	Normalization of preferences
3.3517	4.2731	5.4406	0.1035	0.1667	0.2657	0.886	0.894	0.726	0.575	0.575	0.1506
3.7960	4.7638	6.2026	0.1172	0.1858	0.3029	1	1	0.847	0.704	0.704	0.1844
3.8921	4.7149	5.9390	0.1202	0.1839	0.2900	1	0.989	0.828	0.678	0.678	0.1776
4.3658	5.5407	7.1493	0.1348	0.2162	0.3491	1	1	1	0.861	0.861	0.2254
5.0713	6.3407	7.6572	0.1566	0.2474	0.3739	1	1	1	1	1	0.2620

Criteria	Weight of criteria
Expertise and skills	0.1844
Experience	0.1776
Jurisprudential factors	0.2254
Structural and technical factors	0.2620

Incompatibility rate

CRm	CRg
0.009	0.16

Compatible

According to Table 3, structural and technical factors have the highest priority among the underlying conditions, followed by jurisprudential factors, expertise and skills, experience, and finally, perception.

Table 4. Pairwise comparison and determination of the importance of intervention factors

Intervention factors	Structural and technical factors			Inter-market factors		
Legal factors	1	1	1	1.0194	1.2699	1.6598
Inter-market factors	0.6025	0.7875	0.9810	1	1	1

The fuzzy sum of each row			Fuzzy synthetic extent			Degree of preference Si over Sk	Degree of preference	Normalization of preferences
2.0194	2.2699	2.6598	0.4351	0.5594	0.7344	1	1	0.674
1.6025	1.7875	1.9810	0.3453	0.4406	0.5470	0.485	0.485	0.326

Criteria	Weight of criteria
Inter-market factors	0.326

Incompatibility rate	
CRm	CRg
0,117	0,141
Compatible	

According to Table 4, legal factors have the highest priority among the intervention conditions, followed by inter-market factors.

Table 5. Pairwise comparison and determining the importance of strategies

Strategies	Development of financial knowledge in the field of derivatives and spreading the culture of using them			Use effective regulations and procedures to prevent the misuse of derivatives and maintain market health			Diversify the creation and use of derivatives to attract investors with different tastes and risk-taking capacities			Establishment of a Stability Council between financial institutions (central bank, central insurance, and capital market)		
	Development of financial knowledge in the field of derivatives and spreading the culture of using them	1	1	1	0.574	0.890	1.265	0.599	0.912	1.442	0.803	1.149
Use effective regulations and procedures to prevent the misuse of derivatives and maintain market health.	0.790	1.123	1.741	1	1	1	0.602	0.746	0.955	0.602	0.746	0.955
Diversify the creation and use of derivatives to attract investors with different tastes and risk-taking capacities	0.693	1.097	1.670	1.047	1.340	1.662	1	1	1	0.599	0.758	1.076
Establishment of a Stability Council between financial institutions (central bank, central insurance, and capital market)	0.644	0.871	1.246	1.047	1.340	1.662	0.929	1.320	1.670	1	1	1

The fuzzy sum of each row			Fuzzy synthetic extent		Degree of preference of Si over Sk					Degree of preference	Normalization of preferences
2,976	3,901	0,260	0,142	0,243	0,407	1	0,943	0,868	0,868	0,244	
2,993	3,710	4,701	0,143	0,222	0,370	0,913	0,849	0,768	0,768	0,216	
3,340	4,190	0,408	0,170	0,208	0,418	1	1	0,922	0,922	0,209	
3,721	4,030	0,078	0,173	0,278	0,431	1	1	1	1,000	0,281	

Development of financial knowledge in the field of derivatives and spreading the culture of using them	.244	Weight of criteria
Apply effective regulations and procedures to prevent the abuse of derivatives and maintain market health	.216	
Diversify the creation and use of derivatives to attract investors with different tastes and risk-taking capacities	.259	
Establishment of a Stability Council between financial institutions (central bank, central insurance and capital market)	.281	
Incompatibility rate		
CR	M	CRC
0.019		0.051
Compatible		

According to Table 5, establishing a Stability Council between financial institutions (central bank, central insurance, and capital market) is the highest priority among Strategies. Then diversification in the creation and use of a derivative contract to attract investors with different tastes and risk-taking capacity, developing financial knowledge in the field of derivative contract and spreading the culture of using

them, and using effective rules and procedures to prevent the abuse of derivative contract and maintain market health, in the following ranks Are located. According to the results, the priority of components in each of the main categories (underlying factors, intervention factors, and strategies) is presented in Table 6:

Table 6. Prioritization of components

The degree of importance	Components	Priority	Dimensions
0.262	Structural and technical factors	1	Underlying conditions
0.225	Jurisprudential factors	2	
0.184	Expertise and skills	3	
0.178	Experience	4	
0.151	Perception	5	
0.674	Legal factors	1	Intervention condition
.326	Inter-market factors	2	
.281	Establishment of a Stability Council between financial institutions (central bank, central insurance, and capital market)	1	Strategies
.259	Diversify the creation and use of derivatives to attract investors with different tastes and risk-taking capacities	2	
.244	Development of financial knowledge in the field of derivatives and spreading the culture of using them	3	
0.216	Use effective regulations and procedures to prevent the misuse of derivatives and maintain market health		

6. Discussion and Conclusion

The present study aimed to identify and rank the factors and strategies affecting financial derivative contracts in risk management. Accordingly, using content analysis and coding of interviews, 55 items were obtained as basic concepts from the text of the interviews, which were classified into 11 subcategories and three main categories. Finally, with the help of a fuzzy hierarchical process, to rank the factors and strategies affecting the use of financial derivative contracts in risk management. Accordingly, the first main category identified in the present study is context. Underlying conditions are the conditions under which strategies and actions manage the phenomenon. According to the research results, the underlying conditions in using financial derivative contracts in risk management include 1- structural and technical factors, 2- jurisprudential factors, 3- expertise and skills factors, 4- experience, 5- perception, respectively. According to the results, some points can be made. Awareness of stakeholders, beneficiaries, and policymakers on issues such as risk-taking coverage, speculation, and reduction of financing costs by derivative contracts, the benefits of derivative contracts over their shortcomings, that derivative contracts are not inherently bad financial instruments and personal greed. The motivation for the misuse of derivative contracts (tax evasion, market manipulation, income, balance sheet, etc.) is that the misuse of derivative contracts causes the investor to go bankrupt, not the derivative contract themselves, and the understanding of the risks in general. Dependent on derivative contract, the basis for their perception of the proper use of the financial derivative contract. In addition, better assessment of various risks, tolerance of higher levels of risk, and understanding of complex derivative products require expertise and skills in this area. Also, a better understanding of the direct relationship between benefits or investment and risks, reducing investor fears of possible risks, tolerating recessions, better analysis of existing risks, and more sensible investment decisions require experience and the basis for using financial derivative contracts in line with risk management. In this regard, legal factors such as lack of compliance and updating of laws with the needs of the day, lack of awareness of legislators and executives on various aspects of the derivative contract, little legal protection of investors, lack of effective rules related to internal controls, and also

jurisprudential factors such as non-compliance of some financial instruments with Shari'a rulings, few financial instruments in line with Shari'a rulings, lack of familiarity of financial experts with jurisprudential issues, lack of familiarity of jurists with new financial instruments can be mentioned. The second main identified category of the present study is intervention conditions. Interfering conditions are broad and general conditions that act as facilitators or limiters of strategies. These conditions facilitate and accelerate the implementation of strategies and, as an obstacle, delay them. According to the research results, the intervention conditions in using financial derivative contracts to manage risk include 1- legal factors 2- inter-market factors, respectively. According to the results, some points can be made. Weakness of technical infrastructures related to the derivative contract, the emergence of structures related to new financial instruments in the country, the lack of prominent specialists in designing and localizing derivative contracts in the country are structural and technical factors that use financial derivative contracts to manage risk. Indirectly, it affects. In this regard, legal factors such as incompatibility and non-updating of laws with the needs of the day, lack of awareness of legislators and executives on various aspects of derivative contract, little legal support for investors, lack of close monitoring of fraud and manipulation in the market, lack of adequate laws related to internal controls and also jurisprudential factors such as incompatibility of some financial instruments with Islamic law, a small number of financial instruments in line with Islamic law, lack of familiarity of financial experts with jurisprudential issues and lack of familiarity of jurists with new financial instruments, cited. In addition to the above, inter-market factors such as the relationship between parallel financial markets, the impact of instruments within the derivative contract market, the impact of market risk on the target market of cash flow in favorable conditions and economic crisis, the derivative market impact of price behavior In domestic and foreign markets, he also pointed out that indirectly the use of financial derivative contract in order to manage risk; They are creative.

Strategies are another major category that the present study has identified. Strategies and actions are plans and actions that contribute to applying the model. According to the research results, Strategies

that can be used in using financial derivative contracts to manage risk include 1- Development of financial knowledge in the field of derivative contracts and the spread of the culture of their use, 2- Application of effective rules and procedures to prevent misuse of derivative contract and maintain market health, 3- Diversification in the creation and use of a derivative contract to attract Investors with different tastes and risk-taking capacity and 4- Creating a Stability Council between financial institutions (central bank, central insurance, and capital market). These strategies represent purposeful behaviors, facts, and interactions influenced by the prevailing interventions and contextual conditions.

Considering the issues raised in the research and the results, in general, the present study's findings can be used to develop theories and policies related to derivative contracts and risk management. According to the present study results, it seems that each of the categories, categories, and concepts extracted in this study can be considered a separate research project and the contribution of each of them in evaluating the use of financial derivative contracts to manage risk. Also, in this research, component prioritization is used. The fuzzy hierarchical process was performed, it is suggested to use other weighting methods such as DENP, best-worst, etc., in future research and compare it with the present study results.

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