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Prevailing conditions on comprehensive risk management in Iran's capital market, strategies and future consequences

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ABSTRACT

Objective: based on behavioral finance theories, managers' decisions are not completely rational and are influenced by their cognitive distortions and behavioral biases, which reduce quality of company's performance in relation to capital market, shareholders and other stakeholders. Therefore, their trust and confidence in capital market will also undergo fundamental changes. So, purpose of this research is to examine prevailing conditions (causal, contextual and intervening conditions) on comprehensive risk management in Iran's capital market.

Method: In this research, in order to identify prevailing conditions on comprehensive risk management in Iran's capital market, strategies and its future consequences, initially, the interview was conducted with 20 managing directors, members of board of directors, mid-level managers and senior experts of active and effective manufacturing companies in various industries of country's capital market, as well as current and former senior officials of capital market in 2022. Then, the final researcher-made questionnaire was distributed among financial and capital market experts, and finally, to analyze the received responses from 302 respondents (financial and capital market experts), the partial least squares structural equation modeling method was used in PLS 3 software.

Findings: Findings of research indicate effect of causal, contextual and intervening conditions, as well as interactive effect of causal conditions in contextual and intervening conditions on comprehensive risk management in capital market. Finally, comprehensive risk management in capital market requires strategies such as dynamic thinking, critical thinking, social interactions and awareness and these strategies have consequences including increasing individual ability, optimizing decision process and reducing psychological consequences.

Keywords: Comprehensive Risk Management, Causal, Contextual and Intervening Conditions, Strategies, Future Consequences and Iran's Capital Market.

1. Introduction

Nowadays, uncertainty has cast a shadow over all the affairs of organizations and has changed decision-making process. Changes in price of basic goods, changes in exchange rates, changes in interest rates, and also changes in stock prices are among the things that organizations are constantly dealing with. These changes, beside other environmental changes, have caused emergence of new scientific theories in the field of risk management; theories such as chaos theory has emerged and has imagined organizations in an environment with great complexity and at the same time manageable environment. Financial engineering and integrated risk management has took over the task of controlling risks and by providing new solutions and innovative strategies, it has been able to create systematic methods for commercial, manufacturing and service companies. Risk taking is an integral part of any business. The only thing that is certain about the future is uncertainty and risk. Nowadays, almost all activities and operational processes are viewed through risk measures. The final result of strategic plans of companies should be to create capacity in order to accept more risks; because this is the only way to improve performance. However, in order to expand this capacity, companies must know accepted risks. Instead of being in uncertainty based on speculation or rumor, companies should be able to rationally choose risks. Today, it is rare to find an organization or a company that does not understand importance of proactive risk management (Chen et al, 2019).

In general, risk management is a process that can be carried out by the board of directors, management and other employees of entity, and its aim is to manage uncertainty. Risk management activities include identifying, evaluating, monitoring and reducing the impact of risks on a specific business. A correct and effective risk management program, through appropriate strategies, can minimize costly and stressful problems and reduce claims and insurance premiums. According to economic system and continuous changes in environmental factors, issue of effective risk management in the way that financial and service base companies are run is of particular importance (Asghar Nejad Nouri and Mozahi, 2016).

Agustina & Baroroh(2016) believe that purpose of risk management is to limit risk. So, it is important to design risk models in order to quantify and specify expected losses, unexpected losses and worst-case scenarios are. However, in a business context, risk brings advantages as well as disadvantages. Without risk, there is no opportunity for return. Risk is a variable that can lead to a deviation from an expected output and as a result can affect achievement of business goals and overall performance of the entity.

According to this introduction, in this research, we review conditions governing comprehensive risk management in Iran's capital market, its future strategies and consequences from the perspective of academic experts and financial and capital market experts using structural equation modeling.

In fact, according to these content, this research seeks to answer following basic questions:

What are the conditions (both causal, intervening and contextual conditions) of comprehensive risk management in Iran's capital market? (From academic, market and financial experts point of view)

What are the strategic requirements of comprehensive risk management in Iran's capital market? (From academic, market and financial experts point of view)

What are the consequences of strategic requirements of comprehensive risk management in Iran's capital market? (From academic, market and financial experts point of view)

Theoretical framework and literature review

Not more than half a century has passed since the introduction of risk as one of the main decision-making indicators. During this period, a lot of research has been done about introduction of risk measurement indicators and factors affecting it. Currently, risk management is one of the main branches of financial science, and in all organizations, risk management department is of great importance, and reports of this department are widely considered in organizational decisions. Different opinion about risk have been proposed by researchers. One of these views about risk believes that, risk is the possibility of any fluctuations in future income, and based on another point of view, only possibility of income decreasing or lower income is considered a risk (Beasley and et al, 2019). In ERM approach (Enterprise Risk Management), risk is considered based on first approach and perspective. In other words, both downside Risks (threats) and upside

Risks (opportunities) are considered (Lai and Shad, 2017).

Comprehensive risk management is an integrated and continuous process for risk management in all corporate perspective, including strategic, financial, operational, compliance and credit risks, in order to minimize unexpected performance changes and maximize intrinsic value of the company. This process enables the board and management to make their own risk-reward decisions with more knowledge and information by determining fundamental needs related to corporate governance and policies (including risk appetite), risk data and analytics, risk management, monitoring and performance reporting (Lam and Quinn, 2017).

Risk management provides an opportunity for entity managers to achieve a broad and comprehensive vision about potential events affecting realization of entity's goals. However, since risks are constantly changing as organizations strive to achieve their goals, there is a high demand for relevant and timely risk information. Many organizations are looking for a process development that provides management and board of directors with rich information about potential events affecting economic unit, especially high-level risks, so that they can continuously monitor these risks. Most organizations monitor multiple KPIs; however, these indicators often provide information about risk events that have already had an impact on organization. Therefore, boards of directors and senior executives are increasingly looking for indicators or metrics that will help them better monitor potential future changes in risk or emerging risks so that they can more proactively identify potential impacts of risks on organization's risk portfolio. In this situation, board and management will be in a better position for strategic and timely management of future events. These types of indicators or criteria are known as key risk indicators. Key risk indicators are criteria used by organizations to get early signs of risk in different fields and sectors of enterprise. Sometimes, key risk indicators shows key ratios that management throughout the organization uses as indicators of evolving risks and potential opportunities, and its message is the need to take specific action. However, some other key risk indicators have more details and include aggregation of several separate risk indicators in a multidimensional scale for new events that may lead to new risks or opportunities (Beasley and et al, 2019).

On the other hand, understanding personality differences of managers in listed companies in capital markets can help to better analyze their behavioral functions by shareholders and other investors, so that can make a better interpretation of conditions. Despite the fact that managers are selected from knowledgeable and experienced people in the field of company management and are expected to make rational decisions, studies have shown that managers' behaviors and attitudes influence their decisions (Togok, 2016).

Kuo et al (2022) by investigating corporate social responsibility, enterprise risk management and real profit management: showed evidence of management trust that companies with more effective risk management are more likely to engage in corporate social responsibility behaviors.

Willumsen et al. (2022) presented a model for project risk management by describing steps of identifying, evaluating, classifying and prioritizing, reducing and controlling risk and concluded that decision makers should avoid bias and use customized knowledge of project to prioritize risk and evaluate and make functional decisions before effect of risk on project increase. In this way, it is very important to predict appropriate budget to manage possible risks.

Malik et al (2021) in a research investigated effect of corporate risk management on company performance by examining whether creation of a risk committee at board level, as an important external governance mechanism monitoring corporate risk management processes, strengthened or weakened the company's performance. Based on the data of 121 listed FTSE350 companies in England during the period of 2012-2015, they found that effective risk management has a positive effect on company’s performance. Also, they found that stronger governance of board-level risk committee complements this relationship and increases effects of corporate risk management performance. Other findings showed that simply forming a risk committee at board level is not a solution to monitor corporate risk management; However, the existence of a structurally strong risk committee at board level is very important in order to effectively governing corporate risk management.

Hartono et al (2019) indicate that large companies, as well as companies located in Europe that are more aware of their creditworthiness, are more likely to believe in implementing a risk management program.

Shad et al (2019) in their research reviewed factors affecting comprehensive risk management of companies and concluded that environmental and economic factors affect financial and non-financial risks.

Qaderi Azar and Golestaneh (۲۰۲۲) reviewed relationship between quality of disclosure and risk management on stock price simultaneity in 86 listed companies during ۲۰۱۳ to ۲۰۱۹ and found that there is a significant relationship between quality of information disclosure and stock price simultaneity. Also, another result indicates that there is a significant relationship between risk management and stock price concurrency.

Mohammad Sharifi et al. (۲۰۲۱) investigated the role of organizational risk management on company performance in process of merger and acquisition using Heckman's two-stage model in 54 stock exchange listed companies in period from ۲۰۱۳ to ۲۰۱۸ and showed that the variables of company size, financial leverage and type of industry are among the determining factors of organizational risk management. Also, organizational risk management has a significant effect on performance of companies listed to Tehran Stock Exchange in merger and acquisition process.

Saadatju Ordeklu and Rahimi (2013) investigated risk management and its application in capital market using value-at-risk measurement model and reached the conclusion that use of combined techniques is a suitable solution for optimal allocation of resources and correct choice for investment path, also optimal allocative efficiency for capital market and optimal balance between risk and return.

Overall, results of previous local research show a basic research gap in the field of comprehensive risk management, and that is the failure to present and identify conditions governing comprehensive risk management in Iranian capital market, its future strategies and consequences. The few studies conducted in domestic comparative studies have examined and introduced the existing mechanisms in other countries. It seems that it is necessary to identify conditions governing comprehensive risk management, strategies and its future consequences in the framework of country's capital market, which is also unisonous by experts' views. Therefore, this study tries to answer question by combining qualitative and quantitative methods, what are the conditions governing comprehensive risk management in Iran's capital market, its future strategies and consequences?

Research Hypotheses

In this research, following hypotheses have been developed after determining research components by academic experts.

First research hypothesis: Causal conditions have a significant effect on comprehensive risk management in capital market.

Second research hypothesis: contextual and intervening conditions have a significant effect on comprehensive risk management in capital market.

Third research hypothesis: contextual and intervening conditions have a significant effect on the relationship between causal conditions and comprehensive risk management in capital market.

Fourth research hypothesis: Comprehensive risk management in capital market requires strategies.

Fifth research hypothesis: Comprehensive risk management strategies in capital market have consequences.

Research methodology

Research method

In order to achieve research purposes, qualitative and quantitative (combined) research approach used in this research. In order to gather required data for in qualitative part we use interviews and library studies. Epistemology Base of present research are also closer to interpretative-symbolic school. Method of data collection in quantitative part was through questionnaires.

In current research, data collect in two stages. First set of data is list of components of comprehensive risk management, which was extracted and selected from previous studies. Method of data collection in this section was library method. By studying indicators of comprehensive risk management, a number of indicators were selected among them to select desired risk management components in this study. The selection criterion has been repeated more than three times in the research literature. The second category of data is the opinions of experts, analysts and other users

of information, which were first extracted through surveys and in-depth interviews with experts, components of comprehensive risk management, and finally, in quantitative part, data collected about importance of described components using relevant data questionnaire. Delphi method has been used in interview with experts. In this method, community members must have expertise, experience and knowledge in relevant field and be willing to participate in research.

In qualitative analysis of initial interviews, a qualitative data analysis method known as theme analysis has been used, results of which have been published in a separate paper. Finally, in quantitative part, through partial least squares structural equation modeling, dimensions of model and identified relationships have been evaluated, the results of which are presented in this study.

Sample selection

Our sample is selected from academic and financial experts and capital market experts. Statistical sample of research in the qualitative part included university experts consisting of 14 university faculty members and 6 postgraduate students in ۲۰۲۲. In this section, sampling and data collection continued until saturation point was reached. Categories reach the point of saturation when no new information emerges during coding and categories, their characteristics and dimensions, and relationships between categories are well developed and nothing is added to them by collecting new data. Meanwhile, statistical sample in quantitative section included financial and capital market experts, and final questionnaire created by researcher was distributed among them (400 questionnaires), and finally, to analyze opinions received from 302 respondents (financial experts and capital market), partial least squares structural equation modeling method was used in PLS 3 software.

Research findings

Basic research model

Initial model resulting from previous studies and conducting 20 interviews with managing directors, members of board of directors, mid-level managers and senior experts of active and effective manufacturing companies in various industries of country's capital market, as well as current and former senior officials of capital market in line with conditions governing comprehensive risk management in Iran's capital market, strategies and future consequences is depicted in Figure 1. It should be mentioned that adequacy of interview was achieved when a new component and indicator was not mentioned by academic experts.

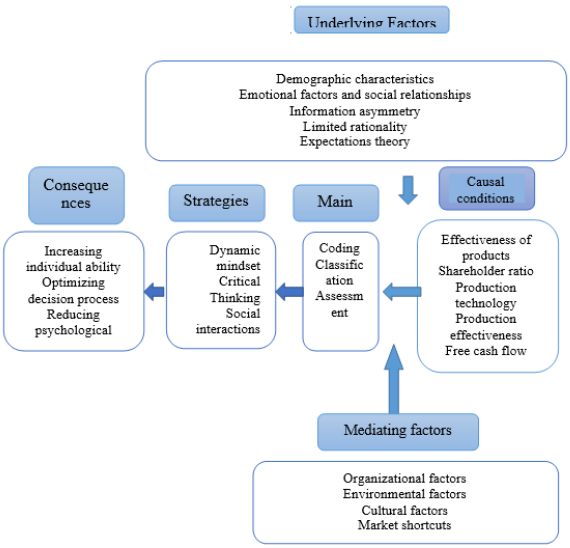

Figure 1: Basic research model

Analysis of respondents' demographic characteristics

According to the results of questionnaires first part (demographic characteristics), information about characteristics of statistical sample in qualitative and quantitative section is provided in following table 1.

Results of demographic information of statistical sample in quantitative section (listed in Table 1) indicate that 73% of sample are men and 27% are women. Also, most of sample had a master's degree or higher. 48% of working activity of research sample was made up of capital market experts. Also, 92% of sample has graduated or is studying in accounting field.

Table 1: Demographic Information

Qualitative section (interview)									
Job experience		**Education**		**Study field**		**Position**		**Sector**	
Under 10 Years	6	PhD	7	Accounting and auditing	10	CEO or Board member	12	Private	4
10-20 Years	9	PhD student	6	Financial engineer	6	Manager	5	Government	12
More than 20 years	5	Master degree	7	economic	4	Chief	3	Both	4
sum	20		20		20		20		
quantitative section (questionnaires)									

variables	-	number	percentage	variables	-	number	percentage
Gender	male	٢٢٠	٧٣	Position	Capital market expert	١٤٤	٤٨
	female	٨٢	٢٧		Broker expert	٣٣	١١
Education	Master degree student	١٨	٦		Financial committee member	١٢٥	٤١
	Master degree	١٢٤	٤١	Job experience	Under 5 years	٥٥	١٨
	PhD student	٢٥	٨		6-10 Years	٩	٣
	PhD	١٣٥	٤٥		11-15 Years	١٠٣	٣٤
Study Field	Accounting	٢٧٨	٩٢		16-20 Years	٨٧	٢٩
	Auditing	١٦	٥		More than 20 years	٤٨	١٦
	Economic	٨	٣				

Table 2: data fit test results

test	statistic	Test type	statistic	Degree of Freedom	significant
KMO	٠/٨٩٤	Bartlett test	٥٢٨٧٣/٠٢٩	٣٥٧٠	<٠/٠٠٠

Inferential analysis of research

In next step of analysis, in order to determine final components of research, analyzes have been performed based on a model using partial least squares (PLS) method through smart pls software.

Data fit test in factor analysis

In conducting factor analysis, first of all, it should be ensured that whether data can be reduced to a few hidden factors or not. For this purpose, KMO and Bartlett test, have been used. The results of data fit test are presented in Table 2.

As the values of KMO test are higher than 70%, therefore, appropriateness of data was confirmed for factor analysis. Also, considering significance of Bartlett's test, it can be seen that the correlation matrix is not the same and there is a correlation between variables and it is possible to perform factor analysis.

Validity and reliability of questionnaire

In this research, in order to determine reliability (validity) of measurement tool (questionnaire), two methods of content validity and construct validity were used. Content validity index (CVI) and content validity ratio (CVR) of Lavoshi (1975) are two tools to

determine content validity in a quantitative way. In this study, by sending a questionnaire to 20 managing directors, members of board of directors, mid-level managers and senior experts of active and effective manufacturing companies in various industries of country's capital market, as well as current and former senior officials of capital market, they were requested to provide the necessary feedback related to the questionnaire. In this questionnaire, they were asked to include their opinion about each item in determined judgment scale. Answers of members were classified into three codes (necessary, useful but unnecessary and unnecessary). Votes of group members were quantified through the following formula:

$$CVR = \frac{n_e - \frac{N}{2}}{\frac{N}{2}}$$

In this formula:

n_e: is the number of experts who answered the "necessary" option.

N: is total number of experts participating in this validation.

Minimum CVR according to selection of 20 experts to determine validity of questionnaire is equal to 0.49. If obtained value is greater than 0.49, content validity of that item is accepted. Also, relative coefficient (CVI) cumulatively calculates favorable scores (necessary and useful but unnecessary) for each item. The higher the content validity, the value of the relative coefficient tends to 1. Following equation determines how to calculate relative coefficient.

$$CVI = \frac{\sum CVR}{Retained\ Numbers}$$

∑ CVR: is sum of calculated values of content validity ratio

Retained Numbers: Number of remaining questions

Also, one of the main issues in discussion of research method is reliability of measurement tool. In this research, in order to evaluate reliability of questionnaire, Cronbach's alpha test was used in SPSS software. Table 3 presents the validity and reliability results of questionnaire.

As content validity ratio (CVR) values of all items are above 0.49 and also, considering that content validity index (CVI) for all criteria is higher than the acceptable value (0.69); Therefore, content validity of all measures is confirmed. Also, considering that value of Cronbach's alpha coefficient is equal to 0.983 in total, it is found that these 62 measures have good internal consistency; therefore, it can be concluded that questionnaire has good reliability and can be used to measure goals the researcher. Also, considering that Cronbach's alpha coefficient of each criterion is above 70%; therefore, none of the criteria of questionnaire is removed.

Main structure	factor	item	CVR	CVI	Loading factor		Reliability of components			Reliability of the main structure		
					First degree	second	AVE	C.R	Cronbach's alpha	AVE	C.R	Cronbach's alpha
strategies	competitors	Q64	%۷۳/۳۳	۱	۰/۸۲۳	۰/٦٥۳	۰/۷۳۲	۰/۸۹۱	۰/۸۱۷	۰/٥٤۱	۰/۸۲٦	۰/۷۹٤
		Q66	%٦۰	۱	۰/۹۰۲							
		Q67	%٦۰	%۸٦/٦۷	۰/۸٤۰							
	industry	Q59	%۸٦/٦۷	۱	۰/٥٥۰	۰/٦۰٦	۰/٥۸۹	۰/۸۷٥	۰/۸۱۷			
		Q68	%۷۳/۳۳	%۹۳/۳۳	۰/۷۳٥							
		Q69	%٦۰	%۸٦/٦۷	۰/۸۲۸							
		Q71	%٦۰	%۹۳/۳۳	۰/۸٥٦							
		Q72	%۷۳/۳۳	%۹۳/۳۳	۰/۸۲٦							
	reputation	Q51	%٦۰	%۹۳/۳۳	۰/٥٦٦	۰/٥٥۹	۰/٥۹۹	۰/۸٥٤	۰/۷۷۳			
		Q73	%۷۳/۳۳	%۹۳/۳۳	۰/۸۲۰							
		Q74	%٦۰	%۸٦/٦۷	۰/۸۲٦							
		Q75	%٦۰	%۹۳/۳۳	۰/۸٤۹							
	Governance	Q52	%٦۰	۱	۰/۸٥٦	۰/٤۰۷	۰/۷۰	۰/۹۰۳	۰/۸٥۷			
		Q53	%۷۳/۳۳	۱	۰/۷۹۷							
	product	Q55	%۸٦/٦۷	۱	۰/۸۹۰							
		Q56	%۸٦/٦۷	%۹۳/۳۳	۰/۸۰۱							

Main structure	factor	item	CVR	CVI	Loading factor		Reliability of components			Reliability of the main structure		
					First degree	second	AVE	C.R	Cronbach's alpha	AVE	C.R	Cronbach's alpha
	Technology change	Q57	%۷۳/۳۳	۱	۰/۷۷٤	۰/٥۹۲	۰/٥۹۲	۰/۸٥۳	۰/۷۷۳			
		Q58	%٦۰	۱	۰/۸۰۰							
	Social policy	Q60	%٦۰	%۸٦/٦۷	۰/۷۷۸							
		Q70	%۸٦/٦۷	۱	۰/۷۲۳							
	Geography	Q61	%۷۳/۳۳	%۹۳/۳۳	۰/۸۸۱	۰/٦۳٤	۰/۸۰۱	۰/۹۲۳	۰/۸۷٦			
		Q62	%٦۰	%۸٦/٦۷	۰/۸۹۷							
		Q63	%٦۰	%۹۳/۳۳	۰/۹۰٦							
financial	Capital finance and cash flow inflow	Q22	%۷۳/۳۳	%۹۳/۳۳	۰/٥٥۲	۰/۷۹۷	۰/٥۰٦	۰/۸۸۸	۰/۸٦٤	۰/۸۱۰	۰/۸۹٥	۰/۷٦٦
		Q23	%٦۰	%۹۳/۳۳	۰/٦۳۷							
		Q24	%۷۳/۳۳	%۹۳/۳۳	۰/٤۷۹							
		Q25	%٦۰	%۸٦/٦۷	۰/٦۹٤							
		Q34	%٦۰	%۹۳/۳۳	۰/۸۱۹							
		Q36	%٦۰	۱	۰/۸۲٦							
		Q37	%۷۳/۳۳	۱	۰/۷۸۲							
		Q38	%۸٦/٦۷	۱	۰/۸۱۱							
	Macroeconomic index	Q26	%۸٦/٦۷	%۹۳/۳۳	۰/۸٤۰	۰/٤۳٦	۰/۷۰۳	۰/۹۰٤	۰/۸٥۹			
		Q27	%۷۳/۳۳	۱	۰/۸٤۸							
		Q28	%٦۰	۱	۰/۸٤٦							
		Q29	%٦۰	%۸٦/٦۷	۰/۸۱۹							
	profitability	Q30	%۸٦/٦۷	۱	۰/٥٤۹	۰/۸۳۸	۰/٥۹۷	۰/۸۷۹	۰/۸۲۷			
		Q31	%۷۳/۳۳	%۹۳/۳۳	۰/۷۸٤							
		Q32	%٦۰	%۸٦/٦۷	۰/۸۲۰							
	credit	Q39	%٦۰	%۹۳/۳۳	۰/۸۱٥							
		Q40	%۷۳/۳۳	%۹۳/۳۳	۰/۸٥٥							
Background and intervention conditions	sale	Q82	%٦۰	%۹۳/۳۳	۰/۸٦٦	۰/۸٤۰	۰/۷۲۲	۰/۹۱۲	۰/۸۷۱	۰/٥۸۳	۰/۷۹۳	۰/۷۱۰
		Q83	%۷۳/۳۳	%۹۳/۳۳	۰/۹۱۱							
		Q86	%٦۰	%۸٦/٦۷	۰/۸۲۷							
		Q134	%٦۰	%۹۳/۳۳	۰/۷۹۱							
	Commercial	Q135	%٦۰	۱	۰/۷۰۰	۰/۸۳٦	۰/۷۰۲	۰/۸۷٥	۰/۷۸۲			
		Q79	%۷۳/۳۳	۱	۰/۹۰٦							
		Q81	%۸٦/٦۷	۱	۰/۸۹۱							
	Inventory management	Q76	%۸٦/٦۷	%۹۳/۳۳	۰/۹۰٦	۰/۷٥۹	۰/۸۲۸	۰/۹۳٥	۰/۸۹٦			
		Q77	%۷۳/۳۳	۱	۰/۹۱۱							
		Q78	%۸٦/٦۷	۱	۰/۹۱۱							
	Human resource	Q85	%۸٦/٦۷	%۹۳/۳۳	۰/۸۹۷	۰/۷٦۸	۰/۸٤۱	۰/۹٤۱	۰/۹۰٦			
		Q87	%۷۳/۳۳	۱	۰/۹۳٥							
		Q88	%٦۰	۱	۰/۹۱۹							
	Asset protection		%٦۰	%۸٦/٦۷	۰/۷۳۹	۰/٦۸٤	۰/٦۳۱	۰/۸۳٦	۰/۷۱۱			
		Q132	%۸٦/٦۷	۱	۰/۷۸٦							
	production	Q133	%۷۳/۳۳	%۹۳/۳۳	۰/۸٥٤							
Casual condition	Information technology	Q113	%٦۰	%۸٦/٦۷	۰/۸۳٤	۰/۷٤۱	۰/٦۷۹	۰/۸۹٤	۰/۸٤۰	۰/۸۳٥	۰/۹۱۰	۰/۸۰۳
		Q114	%٦۰	%۹۳/۳۳	۰/۸٥۹							
		Q115	%۷۳/۳۳	%۹۳/۳۳	۰/۸۷۷							
		Q116	%٦۰	%۹۳/۳۳	۰/۷۱۸							
	Resource allocation	Q110	%۷۳/۳۳	%۹۳/۳۳	۰/۹۱۳	۰/۷۰۱	۰/۷٤٦	۰/۸۹۷	۰/۸۳۰			
		Q111	%٦۰	%۸٦/٦۷	۰/۸۹٤							

Main structure	factor	item	CVR	CVI	Loading factor		Reliability of components			Reliability of the main structure		
					First degree	second	AVE	C.R	Cronbach's alpha	AVE	C.R	Cronbach's alpha
		Q112	%٦٠	%٩٣/٣٣	٠/٧٧٧							
	Data accuracy	Q121	%٦٠	١	٠/٥٦٤	٠/٩٤٠	٠/٦٢٥	٠/٨٦٦	٠/٧٩٨			
		Q122	%٧٣/٣٣	١	٠/٧٩٩							
		Q123	%٨٦/٦٧	١	٠/٨٧٧							
		Q124	%٨٦/٦٧	%٩٣/٣٣	٠/٨٨٠							
	Being on time	Q126	%٧٣/٣٣	١	٠/٨٦٥							
		Q127	%٨٦/٦٧	١	٠/٨٢٨							
	Communication, access to information	Q128	%٨٦/٦٧	%٩٣/٣٣	٠/٧٨٤	٠/٧٥٠	٠/٦٨٧	٠/٩٢٩	٠/٩٠٩			
		Q129	%٧٣/٣٣	١	٠/٨٢٧							
		Q130	%٦٠	١	٠/٨١٢							
		Q125	%٦٠	%٨٦/٦٧	٠/٨٥٤							
consequences	Legal changes and regulations	Q104	%٨٦/٦٧	١	٠/٦٥١							
		Q105	%٧٣/٣٣	%٩٣/٣٣	٠/٦٨٨	٠/٧٥٩	٠/٥٦٦	٠/٨٣٨	٠/٧٥٦			
		Q106	%٦٠	%٨٦/٦٧	٠/٨١٤							
		Q109	%٦٠	%٩٣/٣٣	٠/٨٣٩							
	compliance	Q117	%٧٣/٣٣	%٩٣/٣٣	٠/٨٣٨					٠/٧٣٧	٠/٩٣٣	٠/٩١٠
		Q118	%٦٠	%٩٣/٣٣	٠/٨٥٠	٠/٤٧٤	٠/٦٩٩	٠/٩٠٣	٠/٨٥٦			
		Q119	%٧٣/٣٣	%٩٣/٣٣	٠/٨٣٢							
		Q120	%٦٠	%٨٦/٦٧	٠/٨٢٣							
	Reduction of psychological consequences	Q100	%٦٠	%٩٣/٣٣	٠/٧٩٠	٠/٥٦٤	٠/٦٣٥	٠/٨٣٩	٠/٧٢٠			
		Q101	%٦٠	١	٠/٨١٨							
		Q102	%٧٣/٣٣	١	٠/٧٨١							

It is necessary to include that in reflective measurement model (reflective indices used in present study), checking convergent and divergent validity is also of great importance. Convergent validity refers to degree of correlation that an indicator has with other indicators of same variable. In this research, to check convergent validity, external load criteria of coefficients, composite reliability and average variance extracted have been used. According to Holland (1999), in social science research, it is possible to retain indicators with values between 40 and 70 percent if it does not disrupt content validity of variable and composite reliability and average variance extracted and increases mentioned criteria. Also, values greater than 0.5 for average variance extracted (AVE) and greater than 0.7 for composite reliability (CR) indicate appropriate fit of measurement models and that they are convergent in terms of validity (Holland, 1999). Due to low values of factor loadings and average values of extracted variance, cultural factors, organizational factors and demographic variables removed from structural model. Table 3 shows results of first and second order confirmatory factor analysis.

After conducting confirmatory factor analysis, results of which are shown in Table 3, it is found that all the items have a factor load higher than 0.4, average extracted variance above 0.5, and composite reliability above 7. 0, which shows appropriateness of these criteria and the appropriate reliability of measurement models. Also, in this research, Fornell and Larcker criterion was used to check validity of research divergence.

Fornell and Larcker's criterion is based on the idea that a variable shares more variance with its predictors than with other variables (Hair et al., 2017). Results of the Fornell and Larker test are presented in Tables 4 and 5. After running PLS, extracted average variance values are shown in bold and italics on the main diameter. According to the criteria of Fornell and Larcker, divergent validity is based for research model.

Collinearity Control:

Collinearity statistic indicates that relationship between independent variables is more than their correlation with dependent variable, which causes determination coefficient to increase formally. In this research, Variance Inflation Factor (VIF) has been used to check absence of collinearity problem between research variables, results of which are presented in Table 6.

Table 4. Fornell and Larcker criteria for divergent validity

Latent Variables	Comprehensive risk management	Strategies	Cognitive biases	Background and interfering conditions	consequences
strategies	۰/۹۰				
financial	۰/۸۷۸	۰/۹۱٤			
casual	۰/٥٤۹	۰/٥۱٤	۰/٦٦٤		
Background and interfering conditions	۰/۰۹۱	۰/۰٦۸	۰/٤۷٦	۰/۷٦٤	
consequences	۰/۷۸٤	۰/٦۸۷	۰/٥۹۸	۰/۱٤۲	۰/۸٥۹

able 6. Results of collinearity of indices

Main component	factor	item	VIF	Collinearity of indices
strategies	competitor	Q64	۱/۷۱۲	acceptance
		Q66	۲/۱۷۰	acceptance
		Q67	۱/۷۸٦	acceptance
	industry	Q59	۱/۱۹۷	acceptance
		Q68	۱/٥۳٦	acceptance
		Q69	۲/٤٦۱	acceptance
	reputation	Q71	۳/۲٤٥	acceptance
		Q72	۲/۳٦۱	acceptance
	governance	Q51	۱/۱۹٦	acceptance
		Q73	۱/٥۲۱	acceptance
	product	Q74	۲/۰٥۹	acceptance
		Q75	۲/۱۰۱	acceptance
	Technology change	Q52	۲/۱۳۲	acceptance
		Q53	۱/۸٥٤	acceptance
		Q55	۲/٤۸۰	acceptance
		Q56	۱/۸۷٥	acceptance
	Political, social	Q57	۱/٥۷۲	acceptance
		Q58	۲/۱٥۰	acceptance
		Q60	۱/۹٥۲	acceptance
		Q70	۱/۲۳۱	acceptance
	geographical	Q61	۲/۲۲۱	acceptance
		Q62	۲/۳۸۰	acceptance
		Q63	۲/٥۸٥	acceptance
Financial	Capital finance and cash inflow	Q22	۲/۷۷٦	acceptance
		Q23	۳/٥۰۸	acceptance
		Q24	۱/٦۰۳	acceptance
		Q25	۱/٦۸۷	acceptance
		Q34	۲/۲۹٥	acceptance
		Q36	۲/٤۱۷	acceptance
		Q37	۲/۲٦۰	acceptance

Main component	factor	item	VIF	Collinearity of indices
		Q38	۲/٤۱۸	acceptance
	profitability	Q26	۲/۲۰۲	acceptance
		Q27	۲/۱۸۹	acceptance
		Q28	۲/۱٤٤	acceptance
		Q29	۱/۸۹۹	acceptance
	credit	Q30	۱/۲٥۱	acceptance
		Q31	۱/۸۰۳	acceptance
		Q32	۱/۹٤۲	acceptance
	Economic macro index	Q39	۲/۱۸۲	acceptance
		Q40	۲/٤٥٦	acceptance
operational	sale	Q82	۲/۷۳۸	acceptance
		Q83	۳/٤۹۳	acceptance
	commercial	Q86	۱/۹۲۸	acceptance
		Q134	۱/۷۹۸	acceptance
	Inventory management	Q79	۲/٤۹۷	acceptance
		Q135	۱/۲۸۹	acceptance
		Q81	۲/۳٦۸	acceptance
	Human resource	Q76	۲/۷۲۲	acceptance
		Q77	۲/۷۰۸	acceptance
		Q78	۲/۷۱۹	acceptance
	production	Q85	۲/۳۷٤	acceptance
		Q87	۳/۷۸۷	acceptance
		Q88	۳/٥۰۱	acceptance
	Asset protection	Q131	۱/۳۰۰	acceptance
		Q132	۱/٤۷۷	acceptance
		Q133	۱/٤٤۷	acceptance
reporting	information technology	Q113	۱/۹۹٤	acceptance
		Q114	۲/۲۷۱	acceptance
		Q115	۲/۳۱۰	acceptance
		Q116	۱/٤۱۷	acceptance
	Asset allocation	Q110	۲/٤٥۸	acceptance
		Q111	۲/۱۸٤	acceptance
		Q112	۱/٦۱۲	acceptance
	Data accuracy	Q121	۱/۲۳٦	acceptance
		Q122	۱/۷۷۰	acceptance
		Q123	۲/۱۰۲	acceptance
		Q124	۲/۰۹۹	acceptance
	Being on time	Q126	۲/۹۲۷	acceptance
		Q127	۲/۳۳۰	acceptance
		Q128	۲/۲۳٦	acceptance
	Communication, access to information	Q129	۲/٥۹۸	acceptance
		Q130	۲/۲۰۹	acceptance
		Q125	۲/٦۱٦	acceptance
Legal and compliance	Legal changes	Q104	۱/۸۷٦	acceptance
		Q105	۱/۹۷۳	acceptance
		Q106	۱/۷٤۰	acceptance
		Q109	۱/۷۳۲	acceptance

Main component	factor	item	VIF	Collinearity of indices
		Q117	۲/۱۸۳	acceptance
		Q118	۲/۱٤٦	acceptance
		Q119	۲/۱۰۱	acceptance
		Q120	۱/۸٥٤	acceptance
	compliance	Q100	۱/۲۱۱	acceptance
		Q101	۱/۸۳۹	acceptance
		Q102	۱/۷۲۹	acceptance

Because of the fact that the values of the collinearity statistics of all indicators are less than 5, there is no strong collinearity between indicators.

Structural model evaluation

The most important value used to evaluate structural model is coefficient of determination, which indicates prediction rate of the model. This coefficient is obtained from the square of the relationship between endogenous variables and predictor variables. Based on the opinion of (Hensler, 2009 and Chen, 1998), three values of 0.19, 0.33 and 0.67 are considered as the criterion value for weak, medium and strong values. Also, the predictive power of structural model proposed by Geiser and Stone (1975) shows appropriateness of model's prediction. In fact, a model is suitable when it predicts indicators of latent endogenous variables. In this research, the Q2 criterion was also used to perform this test. Three values of 0.02, 0.15 and 0.35 have been considered as criterion value for weak, medium and strong values.

Table 7. Values of determination coefficient (R^2) and prediction power coefficient (Q^2)

Main component	Latent Variables	R^2	Q^2
strategies	competitors	۰/٤۲٥	۰/۲۹٥
	industry	۰/۳٦٥	۰/۲۰۱
	reputation	۰/۳۱۰	۰/۱۷۰
	governance	۰/۱٦۳	۰/۱۰۷
	product	۰/۳٤۸	۰/۱۸۷
	Technology change	۰/٤۰۰	۰/۳۰٥
	Political, social	۰/۳۸۸	۰/۱۹٥
	geographical	۰/۳۹۲	۰/۲٥۲
Financial	Capital finance and cash inflow	۰/۷۰۱	۰/۳۸۸
	profitability	۰/٦۳۳	۰/۲۷٥
	credit	۰/۱۸۷	۰/۱۲۳
	Economic Macro indices	۰/۷۰٥	۰/٤۷۷
operational	sale	۰/٦۹۸	۰/٤٦٤
	Commercial	۰/٥۷٥	۰/٤٤۸
	Inventory management	۰/٥۸۸	۰/٤٦٥
	Human resource	۰/٤٦٦	۰/۲۷٤
	production	۰/٤٥۱	۰/۲٤۸
	Asset protection	۰/٥٤۸	۰/۳٤۹
reporting	Information technology	۰/٤۹۰	۰/۳٤۳
	Resource allocation	۰/۸۸٤	۰/٥۰٦
	Data accuracy	۰/٥٦۲	۰/۳٥۷
Legal and compliance	Legal changes	۰/۳۱٦	۰/۱۸۱
	compliance	۰/۲۱٥	۰/۱۹۱

Results of both tests based on Table 7 indicate a relatively strong fit of model with regard to endogenous variables.

Goodness of fit Measure

The overall model in structural equations included both measurement model and the structural model, and by confirming its fit, fit check is completed in one model. To check the fit of the overall model, goodness of fit criterion (GOF) of Tenenhaus et al. (2005) is used:

$$GOF = \sqrt{\overline{AVE} \times \overline{R2}} = \sqrt{0/680 \times 0/489} = 0/577$$

As GOF value is higher than 0.36, the overall fit of the model is strong.

Testing research hypotheses

After examining fit of measurement and structural models and having appropriate fit of models, research hypotheses examined and tested. In the following, the significant results of the coefficients for each of the hypotheses, the standardized coefficients of the paths related to each of the hypotheses and the results of examining the hypotheses at the 95% confidence level are presented in Table 8.

Table 8. Results of research hypotheses test

hypothesis	Relationship between variables	(β)	(T-Value)	(P-Value)	Test result
H_1	Casual condition and comprehensive risk management in capital market	۰/٦٦٦	۸/۷٦۱	۰/۰۰۰	confirmed
H_2	Background and intervention condition	-۰/۲۱۷	۳/۹۸۰	۰/۰۰۰	confirmed
H_3	Background and intervention condition and casual condition and comprehensive risk management in capital market	۰/۰۹٦	۲/۰۲٥	۰/۰٤۳	confirmed
H_4	comprehensive risk management in capital market and strategies	۰/۸۷۸	۷٤/٦٤۲	۰/۰۰۰	confirmed
H_5	Strategies and consequences	۰/٦۸۷	۲۳/۸۷۱	۰/۰۰۰	confirmed

Significant coefficients of variables are shown in Table 8. As significant coefficients of variables are more than absolute value of 1.96, there is not enough evidence to reject research hypotheses. In other words, hypotheses are confirmed.

Discussion and conclusion

Reviewing conditions governing comprehensive risk management, strategies and its future consequences in Tehran Stock Exchange (Iranian capital market), which is considered inefficient and developing market, is very essential and necessary. In this regard, this issue reviewed in this study.

Results summary of hypotheses is as follows:

According to financial and capital market experts, among causal conditions, ratio of shareholders has been effective on comprehensive risk management. Among background conditions, emotional factors and social relationships, information asymmetry, limited rationality and theory of expectations have been effective on comprehensive risk management. Also, environmental factors and market shortcuts, including mediating factors, have been effective on comprehensive risk management.

Other results indicate that according to financial and capital market experts, comprehensive risk management in capital market requires strategies and prerequisites such as dynamic thinking, critical thinking, social interactions, and awareness.

Finally, results showed that comprehensive risk management strategies in capital market will have consequences such as increasing individual ability, optimizing decision making process and reducing psychological consequences.

Practical suggestions

1. With regard to effect of shareholders ratio on comprehensive risk management from financial and capital market expert's point of view, it seems that by increasing ratio of shareholders, it is possible to take

steps towards effective management of comprehensive risk in Iranian capital market. Therefore, it is suggested to Tehran Stock Exchange and Securities Organization as the trustee of the capital market, in order to increase efficiency of capital market and optimal and effective risk management in this market, and in order to increase the proportion of shareholders in active listed companies, provide necessary platform and take measures in this field.

2. Also, considering effect of bounded rationality and expectations theory on comprehensive risk management, it seems that managers' cognitive distortions and behavioral biases have also been effective on effective management of comprehensive risk in Iranian capital market. Therefore, it is suggested to active professionals in capital market, including potential shareholders of listed companies, in order to manage their financial resources and in order to accurately assess comprehensive risk in companies, in addition to quantitative factors, they should consider behavioral factors. The financial analysts of listed companies are also suggested to consider behavioral patterns along with quantitative patterns in order to accurately assess comprehensive risk.

3. Finally, considering important consequences of comprehensive risk management strategies in Iran's capital market, including increasing individual ability, optimizing decision making process and reducing psychological consequences, it is also suggested for financial managers in order to effective management of comprehensive risk in companies, spend more and pay special attention.

Suggestions for future research

1) Using meta-analysis method in examining factors affecting comprehensive risk management in Iran's capital market in order to summarize final factors affecting comprehensive risk management in Iran's capital market in previous researches.
2) Determining modulating criteria of final factors affecting comprehensive risk management in Iran's capital market in previous researches, including type of study (internal and external), the type of comprehensive risk management assessment model, type of definition of effective factors, etc., using meta-analysis approach.

Research limitations

Some of the limitations of this research are as follows.

1) Restriction due to the type of information gathering tool. Questionnaires are in form of attitude measurement and the results due to the limitations of the validity of questionnaires should be interpreted very cautionary.
2) Tiredness, busyness and lack of motivation of people when answering the questions and in completing the questionnaire.
3) Limitation due to time shortage, high cost and lack of research facilities.

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