



Identifying and Determining the Importance of Central Bank Transparency Measurements, Capital Market Reaction Metrics, And Micro and Macro Factors Affecting Capital Market Reaction Using Delphi and Dintel Fuzzy Method

¹Mahdi Moazzami, ²Mohsen Rasoulia (author in charge), ³Mohammad Hossein Wadie, ⁴Maysam Arabzadeh, ⁵Ismail Mazrouei Nasrabadi

¹PhD student, Department of Management and Accounting, Kashan Branch, Islamic Azad University, Kashan, Iran

Email: M. Moazzemi@cbi.ir

²Associate Professor, Department of Management and Accounting, Kashan Branch, Islamic Azad University, Kashan, Iran

Email: mohras@gmail.com

³Associate Professor, Department of Accounting, Faculty of Administrative and Economic Sciences, Ferdowsi University of Mashhad, Mashhad, Iran

Email: mhwadeei@um.ac.ir

⁴Assistant Professor, Department of Accounting, Kashan Branch, Islamic Azad University, Kashan, Iran

Email: arabzadeh62@yahoo.com

⁵Assistant Professor, Department of Business Management, Faculty of Financial Sciences, Management and Entrepreneurship, Kashan University, Kashan, Iran

Email: drmazroui@kashanu.ac.ir

Abstract:

Central Bank Transparency In Aspects such as Monetary Policy and Analysis of Macro-Economic Variables by Central Banks has an important role in publishing information to money and capital markets in relation to capital decisions and Examining the prospective trajectory of the economy, Consequently, it can bring the reaction of the money and capital market in dimensions such as a change in the level of systemic risk and the market's expected rate of return. In the past, all monetary policy decisions were made secretly, but since the 1990s, when transparency became the focus of central banks, a paradigm shift occurred and gradually central banks committed to transparency in monetary policy decisions and analysis of their economic conditions.



In this regard, the present research identifies and determines the level of importance of central bank transparency dimensions, market reaction measures and micro and macro economic factors affecting the capital market reaction by using the combined method of Delphi and Dimetal Fuzzy. Research findings showed that operational, political, procedural, policy, and economic transparency as Spatial measurements of central bank transparency, change in conditional value of risk and value at risk and systemic risk as dimensions of risk, company value to capital, asset size and Liquidity of assets as micro-financial components, market return index and stock exchange value index, as micro-economic components, financial instability, investment growth, financial development, GDP growth, price index growth, monetary base and rate Real interest has been identified as macroeconomic components.

keywords: Central Bank Transparency, Monetary Policy Decision, Capital Market Reaction, Systemic Risk, Delphi And Dimtel Fuzzy Method.

Introduction

Central bank monetary policy statements in each country, which can communicate expansion or contraction policies, play an important role in publishing information to financial markets on the future process of economics (Broto, Carmen et al., 2021). Financial and economic literature on the level of financial transparency and its promotion by improving the effectiveness of the central bank's communications is a debate that has expanded with a growing trend over the last two decades. The recent independence of some central banks has meant that financial or economic theorists, academic circles and senior managers, policymakers and central banks have been forced to establish a central bank communication with financial and monetary markets on the one hand and the public. On the other hand and its effectiveness should be taken into consideration (Yazdani, Tayebi and Yazdani, 2015). In order to advance the tendency towards central transparency, one can contemplate the brief historical course of this attitude. From Bruner's complaint (1981) to refusal to refuse to communicate with others to Blaward's argument (1996) that more communication could increase monetary policy effectiveness and to Woodford's claims (2001). The concept of monetary policies involves the strategic management of anticipations and perceptions. Woodford may have overstated the significance of the final point, however, the notion that monetary policy plays a role in managing expectations is increasingly accepted within academic and central banking circles. This assertion is not unfounded. (Zhang et al, 2022).

Studies in the field of transparency of the Central Bank show that most of the research has been conducted at advanced countries and developed economies and countries such as: America, Canada, Europe, etc. (Afshari & Finance, 2019). According to existing literature, although the research series related to the Central Bank's Transparency Assessment (CBT) is growing, the findings are mixed and sometimes even contradictory. Therefore, given the importance of the central bank's transparency and the existence of various methodologies, the present study identifies and determines the importance of the central bank's transparency measurements, capital market reaction and micro and macro factors affecting the capital market reaction.

Research Methodology

This research has been used by using a model explained in the financial industry, including: banks and credit institutions, investment companies, and ultimately companies and brokers with the ideal of providing guidelines to improve performance in the research territory, so it can be possible. This research called the type of applied research. The statistical population in this study includes financial and banking experts and experts, including the country's banking, financial and monetary professors and policymakers who hold a doctorate in economics, financial or accounting and scientific and performance experience in the financial or monetary field. . From this unlimited and unlimited community, 25 people have been selected by the Delphi way. The data required for this study has been used to formulate history, subject literature, and theoretical foundations of the library using Latin and Persian books, theses, and especially the Latin articles of authentic financial journals of information sites and use using Analyzed from Excel and SPSS software.

Fuzzy Delphi Technique has been used to identify the central bank's transparency measuring, capital market reaction and micro and macro factors affecting the capital market reaction. The purpose of the foic is its fisherman, which is the remainder of the variables or factors that have no more effect; In other words, the fuselage of the fuselage variables of the main and the main variables of the variables. The copyright method of the manner of the company is very much in charge of the scientific validity of the corporate professionals. Therefore, the examination of the experts questioned between 5 and 20 will be sustained in this study (Derakhshesh et al., 2019). Fazi Delphi stages are in line with:

- 1- Collecting Expert Group Comments
- 2- Conversion of theological variables to the phase triangular relief. For the purpose of the fisherman's Delphi, this part of the method was used (habibi et al., 2015) And the following.

Table 1: Fuzzy Delphi Language Scale

No important	little importance	medium importance	Important	Very important	Linguistic scale
(0.25, 0.00, 0.00)	(0.50, 0.25, 0.00)	(0.75, 0.50, 0.25)	(1.00, 0.75, 0.50)	(1.00, 1.00, 0.75)	Triangular fuzzy scales



3- Creating a fuzzy number for any report. The easiest way to integrate comments in the fuzzy Delphi process is to calculate the an account the following:

$$F_{AVE} = \frac{\sum I}{n} m \frac{\sum m}{n}, \frac{\sum u}{n}$$

4- Fuzulating: One of the most commonly used methods for converting fuzzy numbers to definitive numbers is the use of the "Minokouski" formula:

$$x = 1 + \frac{u - m}{4}$$

5. Factors screening. Finally, the appropriate criteria are screened among the countless criteria with the use of threshold A. If it is $S_{ij} \geq a$, the influential factor will be accepted and if $S_{ij} < A$ is deleted. The threshold level is established by the cognitive decision-making capacity and has a direct impact on the quantity of factors that are screened. There is no universal guideline for setting the threshold. In this research, mean values were computed and factors below the mean were excluded. In the following, the identified factors are structured using "Fuzzy Dematel Technique" and their causal and disabled relationships are examined. Dimtel's technique has two major functions:

1- The primary benefit of mutual communication compared to other methods lies in its ability to clearly and transparently depict interactions among numerous components. This enables experts to articulate their perspectives on the impacts, trends, and magnitudes of these factors.

2- By organizing intricate factors into causal groups, decision makers can enhance their understanding of relationships. This involves categorizing a diverse array of complex factors into causal groups, thereby facilitating a more structured approach to decision-making. This position is more than the point of fact and the role it has influenced by Jerushan.

The steps of this technique are as follows:

1- Collecting Expert Group's Comments: Experts' views for evaluating the internal relationships of factors to calculate Dimtel through couples comparisons and the impact between the criteria based on language options and the positives of the following are identified as follows.

Table 2: The fuzzy equivalent of points

Very high impact	high impact	Medium effect	Low impact	Completely unaffected	Verbal phrases
(1, 1, 0.75)	(1, 0.75, 0.5)	(0.75, 0.5, 0.25)	(0.5, 0.25, 0)	(0.25, 0, 0)	Fuzzy values
4	3	2	1	0	score (definite numbers)



2- Forming the matrix of fuzzy direct relations. By converting the linguistic estimates into the fuzzy equivalent of the scores, the initial direct relationship matrix of $A = [a_{ij}]$ is obtained.

3- Fuzzy Deconvolution of initial direct matrix values; The converting fuzzy data into crisp scores (CFCS) is used for fuzzy deconstruction. The output of the CFCS algorithm is the initial direct relationship with the definitive values, which is obtained by the measuring of the an accounting method to integrate the expert's perspective, indicating the direct effect of factor I on the factor J.

4- Creating a normal initial direct matrix. The Matrix of Direct Relationships X is obtained using the following relationship.

$$X = S * A \quad K = \min \left(\frac{1}{\max \sum_{j=1}^n |z_{ij}|}, \frac{1}{\max \sum_{i=1}^n |z_{ij}|} \right)$$

5- Creating a general relationship matrix. After establishing the normalized direct correlation matrix X, the total correlation matrix T can be derived through the utilization of four interfaces, with I denoting the identity matrix.

$$T = X + X^2 + X^3 + \dots = \sum_{i=1}^{\infty} X^i \quad T = X(I - X)^{-1}$$

6- The process involves calculating the total of the rows and columns in matrix T. To establish the relationship mapping, vectors R and C are employed. The sums of the rows and columns in matrix T are determined through specific algebraic equations.

$[t_i]_{n \times 1}$ is the final transpose matrix .

$$R = [R_i]_{n \times 1} = \left(\sum_{j=1}^n t_{ij} \right)_{nC1}$$

$$C = [C_i]_{n \times 1} = \left(\sum_{i=1}^n t_{ij} \right)_{n \times 1}$$

The variable R_i represents the aggregate of values in the first row of matrix T, denoting the cumulative direct and indirect impacts of factor i on other factors. Similarly, C_i signifies the summation of values in the jth column of matrix T, reflecting the combined direct and indirect influences that other criteria exert on criterion j. If $r_i - c_i$ is positive, it means that other factors are affected by factor i and the factor in question is definitely a cause, and on the contrary when $r_i - c_i$ is negative, other factors affect factor i and the mentioned factor will definitely be disabled. $r_i + c_i$ also indicates the total intensity of a factor, both in terms of effectiveness (cause) and effectiveness (disability).

7- Setting the threshold value and preparing a map of influencing relationships in order to explain the relationship structure between the factors that are in complex systems. It is necessary to set a threshold so that some insignificant traces in the matrix are removed. Only the factors whose threshold value is greater should be selected and displayed in the correlation effect map (Lee et al, 2011).



Identification of the central bank's transparency measurement index

The idea of central bank transparency is used in various forms and meanings, and monetary policy transparency is a kind of continuous flow of information from monetary authorities to the public about their policies and goals, the preferences of central bankers, their interpretation of how the economy works, their knowledge of data, Expectations are related to the future and finally the chosen strategy in policymaking (Ehsani et al., 2018). A brief overview of the research literature based on the analysis of empirical evidence obtained from previous studies shows that the primary turning point in the literature of central bank transparency, the study of Fry, et al. (2000) is. The strength of the mentioned research is the analysis and wide country coverage of the transparency of the central bank, which was conducted based on the Bank of England survey of ninety-four central banks, and relying on the survey and the relatively harsh definition of transparency in this research is one of the limitations of the said research. Is. Fry et al. (2000) Central bank transparency was assessed by calculating an average of three sub-indices with equal weights: 1) the timeliness of public explanations regarding the central bank's policy decisions; 2) the frequency and format of analytical reports made available to the public by the central bank under evaluation; and 3) the regularity of Central Bank bulletins, lectures, and research publications.

Blinder et al. (2008) during a research specifically devoted to the evaluation of central bank transparency in developed industrialized countries. The aforementioned researchers based on the analysis of empirical evidence obtained from their research have relied on a detailed examination of the communication strategy and performance as two basic dimensions in determining the transparency of the central bank.

Their indicators, based on which the proposed model is defined, are: The concept of transparency in governance encompasses various dimensions, including political transparency, economic transparency, procedural transparency, policy transparency, and operational transparency. Political transparency pertains to the openness regarding political objectives. Economic transparency involves the disclosure of data, models, and forecasts. Procedural transparency relates to the transparency in decision-making processes, often achieved through the publication of meeting minutes and voting records. Policy transparency involves the openness about the implications of economic, financial, and monetary policies, typically communicated through the prompt announcement and explanation of decisions. Operational transparency, or procedural transparency, refers to the transparency in the execution of decisions, including the acknowledgment of control errors and macroeconomic disruptions and their impact.

The aforementioned researchers distinguished three subgroups in each of these five dimensions and finally presented a 15-dimensional index. The research has established a comprehensive general index that consolidates the scores derived from five dimensions, each of which incorporates a weighted average of its respective sub-dimensions. This methodology offers a robust and multifaceted framework for assessing transparency.

Eijffinger, Geraats (2006), following the model proposed by Geraats (2000), used a

5-dimensional model in explaining the transparency dimensions of the central bank. He considered five aspects of transparency including: 1) political transparency , 2) economic transparency , 3) procedural transparency , 4) policy transparency , and 5) operational transparency . based on the model proposed by Gratz (2000); Ejifinger and Gratz (2002); Each of these 5 aspects of transparency can create different motivations for transparency and its brief description is as follows:

Policy transparency involves the disclosure of policy objectives and institutional structures to elucidate the rationale behind the actions of monetary policymakers. This facet of central bank transparency encompasses elements such as explicit inflation targets, central bank autonomy, and contractual agreements.

Economic transparency pertains to the availability of economic information utilized in monetary policy formulation, encompassing economic data, policy models, and central bank projections.

Procedural transparency delineates the processes involved in making monetary policy decisions. This aspect of transparency encompasses the monetary policy framework, documentation of policy deliberations, and is typically manifested through the dissemination of meeting minutes and voting records during policy formulation.

Sebastiatic transparency in policy denotes the prompt communication and justification of policy determinations, along with indications of potential future policy directions in the form of policy inclinations.

Operational transparency concerns the execution of monetary policy measures, including discussions on operational instrument efficacy and macroeconomic transmission disruptions. The mentioned pattern is summarized in Table No. 3 as follows. The mentioned model is defined in 5 dimensions, each dimension is defined based on three criteria and a total of 15 single point criteria, finally 15 points are considered for full transparency.

The literature review based on the analysis of empirical evidence shows that the model of 15 criteria and points for Quantifying the transparency of the central bank has been used in many researches at the level of Iran and the world, including the researches such as: Baker et al (2016) ; Woolley and Grounder (2017); Hansen et al (2017); Nakamura, Steinsson (2018); Lustenberga and Rossi (2020); Husted et al (2020) noted.

Table 3: Transparency measurement criteria

Criterion	Factor	Row
Having official goals	Political transparency	1
Objective and quantitative goal setting		2
Having institutional arrangements and systems		3
Periodic publication of monetary, financial and economic data	Economic transparency	4
Using models for policy making		5
Publication of economic forecasts		6



Developing and communicating a clear strategy	Procedural transparency	7
Publication of meeting minutes and documents		8
Publication of documents and decision-making documents		9
Quick notification	policy transparency	10
Explanation of policies		11
Adherence to policies		12
Control of errors and deviation from goals	Operational transparency	13
Reflecting functional disorders		14
Evaluating policy outcomes		15

Identification of systemic risk metrics

The review of the research literature based on the empirical evidence obtained from the previous researches shows that there are two main directions for determining the systemic risk. One method of assessing systemic risk in the banking sector involves analyzing banks' balance sheet positions and risk exposure, typically based on confidential information provided by banks to regulatory authorities. This approach addresses micro-ethical concerns by examining the concentration of risk within different banks.

Another approach utilizes capital market data, such as stock returns and CDS spreads, along with accounting data. Developed post-2008 financial crisis as an alternative to the first method, which relies solely on accounting data, this approach focuses on external factors resulting from individual bank failures and aims to inform macroprudential regulations. Bisias et al. (2012) identified 31 systemic risk criteria in their research, with subsequent studies further exploring this area.

They use the second approach to identify important banks in terms of systematic risk.

Although based on research literature and content analysis approach, it is possible to identify systemic risk indicators. It can be said that two risk metrics, which are the most widely used systemic risk measurement metrics, have been used based on market data and accounting data.

- Conditional value at risk: As the first criterion for measuring systemic risk in this research, it is the conditional value at risk, which will be indicated by the CoVaR symbol. Adrian and Brunnermeier (2016) introduced a metric that quantifies the particular risk or the highest potential loss that an asset, such as stocks, a portfolio, or an entity like a bank, may incur at a given confidence level, typically set at 99%.

Conditional value at risk (CoVaR) is the risk of the banking system, provided that a bank is in crisis or financial helplessness. In this context, the critical value for a bank experiencing financial distress is characterized as the detriment resulting from the reduction in the market worth of the bank's overall assets during exceptional circumstances. The market value of the assets is



determined initially by the book value of the total assets, which is then multiplied by the ratio of the market value of the stock (market capitalization) to the book value of the stock. This assessment defines the system as the aggregate market assets of the banks within the analyzed sample.

Technically, conditional value at risk (CoVaR) means the implementation of quantal regression (QR) based on empirical performance data in which the market value of the total assets of banks as a function of market indicators that value at risk of institutions Fits Mali as a regression function exposed to common factors. Common market indicators are consistent for all sample banks in the territory under review (a sample of Middle Eastern banks and developed banks).

Most of the previous researches have used the set of market indices in global financial markets to estimate the share of banks and estimate the value at systemic risk. Usually, in these studies, variables such as the change in the quarterly rate of treasury bills, the change in the slope of the performance curve, the expansion of TED, the return of the capital market based on indicators such as S. are P. or volatility of return on equity (CRSP) and others (Adrian and Brunermeyer, 2016; Acharya, et al, 2017).

In this study, other methods have been used to measure systemic risk based on the model proposed by Bai et al., (2017), during which, based on simultaneous severe yield shocks, the spread of financial crisis across countries in a region and Different regions offer. The findings of this study indicate that systemic risk can be anticipated by analyzing the regional interest rate, fluctuations in exchange rates, and conditional variations in stock returns.

Following the proposed model of Andrieş et al (2020), in this study, the next variables defined are 4 financial indicators: return rate, ten-year and one-month spread of government bonds, change in interest rate, change in the difference between three-month rates Internal interest and market interest, and foreign exchange market rate. This collection of market indicators will analyze trends in the interbank market, currency market, capital market, and government bonds.

- The risk of insufficient capital: the second criterion used is the systemic risk index (SRISK), which was invented by Acharya et al. (2017). Systemic risk index (SRISK) is related to the predicted lack of capital in a given bank, which depends on the occurrence of critical conditions that affect the entire financial system. It expanded the expected marginal shortfall (MES) to take into account both liabilities and bank size. It is assumed that the financial institutions with the greatest lack of capital are risk-takers and therefore have a greater share in systemic risk.

Based on the content analysis of the research literature, the systemic risk measures are as described in Table 4:



Table 4: Systemic risk measures

Measuring scale	code	Variable description
The measure of the 1st bank's contribution to systemic risk is determined by calculating the difference in value at risk between the market value of total assets at risk in the event of the bank's failure (at the first percentile) and the median market value within the sample. This metric is derived through quantile regression analysis, where the total market value of system assets is influenced by individual bank asset values and a selection of market indices that assess financial institutions' exposure based on shared factors. These common factors include the financial return index level, the spread between ten-year and one-month government bond yields, fluctuations in bond rates, variations in quarterly bank and market stock returns, and annual market return volatility.	$\Delta CoVaR$	Change in conditional value at risk
The quantile regression method is utilized to estimate the maximum potential loss and a proportion of the overall market value of assets that a bank may incur with a confidence level of 99%. This estimation involves assessing the market value of Bank i's total assets by analyzing a range of market indicators across a sample of financial institutions. Key factors considered in this estimation include the financial index return level, the variance between ten-year and one-month government bond spreads, fluctuations in bond rates, variations in three-month returns of bank and market stock rates, and market return volatility. The resulting estimation is presented on an annual basis.	VaR	Value at risk
Iam Bank's loss in the year depends on the helplessness of the whole system, which is defined on the basis of 1% of the worst results or market capital return.	$SRISK$	Systemic risk

Identification of micro and macro economic indicators

During the current research, in order to identify micro and macro economic components affecting financial indicators in the field of research, the exploratory model of Nishiyama, 2016 has been used. In this model, identification and classification of micro and macro economic components affecting financial indicators at the micro level based on summarizing the background of previous

related and similar researches and in other words analysis of the content of the literature and then classification using content analysis has been done. . The summary of the results related to the identification and classification of the effective micro and macro economic components is described in Table No. 5 and the determined indicators are highlighted.

Based on the analysis of the field of knowledge and the pattern of content analysis in qualitative data, the micro and macro economic components affecting the financial indicators as summarized in Table No. 3 have been twenty one. Micro and macroeconomic components affecting financial indicators in three general financial categories, including: asset structure (mortgage assets and tangible assets), growth opportunity (asset growth, company value to debt, company value to capital and value company to assets), company size (asset size and income size), liquidity (current ratio, current ratio and liquidity of assets), business risk (commercial risk), tax shield (non-debt coverage), microeconomics (transaction index, Stock market trading volume index, stock market total price index, market return index, stock market transaction value index, price index, cash price return index, industry index, average sales of all companies, free floating stock index, first market index, second market index, index of top 50 companies, index of 30 large companies, financial index) and macroeconomic components including: financial instability, added value of industry, production growth, investment growth, data value of industrial activity, total income of an urban household, durable goods, change Exchange rate, stock development, financial development, long-term facility rate, GDP growth, price index growth, household consumption expenditure, service consumption expenditure, general consumption expenditure, consumer price, producer price index, wholesale price Commodities, monetary base, banknotes and coins, quasi-money, export of goods and services, real interest rate, one-year deposit rate, share of industry workers and share of service workers.

Importance measurement and refinement of research model components

In this section, in order to refine and evaluate the appropriateness of the model components including: central bank transparency measurement criteria, systemic risk and micro and macro economic components affecting the financial indicators identified based on the analysis of the knowledge area and content analysis, from the perspective method Persuasive Delphi measurement and fuzzy Dimitl multi-criteria model were used, and the process of evaluation and refinement of the said components is explained below.

Table 5: Identification and classification of effective micro and macroeconomic components (source: research findings)

<i>gauge</i>	<i>variable</i>	<i>type</i>
Mortgage assets	Asset structure	micro-financial components
Tangible assets		
Asset growth	growth opportunity	



<i>gauge</i>	<i>variable</i>	<i>type</i>
The company's value is in debt		
Company value to capital		
Company value to assets		
Asset size	Company size	
Income size		
current ratio	Liquidity	
instantaneous ratio		
Liquidity of assets		
Commercial risk	Business risk	
Non-debt coverage	Tax shield	
Trading index		micro-economic components
Trading volume index in the stock market		
Total stock price index		
Market return index		
Index of the value of transactions in the stock exchange		
price index		
Cash price yield index		
Industry index		
Average sales of all companies		
Free floating stock index		
First market index		
Second market index		
Index of top 50 companies		
Index of 30 large companies		
Financial index		
Financial instability		macro-economic components
Added value of the industry		
Production growth		
Investment growth		
Data value of industrial activity		
The total income of an urban household		
Durable goods		
Exchange rate change		
Stock development		
Financial development		
Long term facility rate		



<i>gauge</i>	<i>variable</i>	<i>type</i>
	GDP growth	
	Price index growth	
	Household consumption expenses	
	Service consumption costs	
	General consumption expenditure	
	consumer price	
	Producer price index	
	Wholesale price of goods	
	Monetary base	
	Banknotes and cash registers	
	pseudo money	
	Export of goods and services	
	Real interest rate	
	One-year deposit rate	
	Share of industry workers	
	Share of service workers	

In fact, the Delphi method is a complete review of experts' opinions, with three main features: 1. Anonymity of respondents and unbiased answers to questions (questionnaires), 2. Repeated sending of questions (questionnaires) and Receiving input from individuals, and 3. Quantitative analysis of answers to questions has been done in groups. Finally, the refined components based on using a fuzzy Delphi survey of experts and a multi-criteria approach are summarized as described in the table below:

Table 6: Refined components of the proposed model based on using fuzzy Delphi survey of experts

<i>Measurement method</i>	<i>Dimensions</i>	<i>variable description</i>
Having official goals	Political transparency	Transparency of the central bank
Objective and quantitative goal setting		
Having institutional arrangements and systems		
Periodic publication of monetary, financial and economic data	Economic transparency	
Using models for policy making		
Publication of economic forecasts		
Developing and communicating a clear strategy	Procedural transparency	
Publication of meeting minutes and		



documents		
Publication of documents and decision-making documents		
Quick notification	policy transparency	
Explanation of policies		
Adherence to policies		
Control of errors and deviation from goals	Operational transparency	
Reflecting functional disorders		
Evaluating policy outcomes		
Money and capital market performance data	Change in the conditional value of risk	Risk
Money and capital market performance data	exposed value	
Money and capital market performance data	Systemic risk	
Money and capital market performance data	Company value to capital	micro-financial components
Money and capital market performance data	Asset size	
Money and capital market performance data	Liquidity of assets	
Money and capital market performance data	Market return index	micro-economic components
Money and capital market performance data	Index of the value of transactions in the stock exchange	
Money and capital market performance data	Financial instability	macro-economic components
Money and capital market performance data	Investment growth	
Money and capital market performance data	Financial development	
Money and capital market performance data	GDP growth	
Money and capital market performance data	Price index growth	



Money and capital market performance data	Monetary base	
Money and capital market performance data	Real interest rate	

Conclusion

The transparency of the central bank in dimensions such as the announcement of monetary policies, the analysis of macroeconomic variables by central banks has an important role in disseminating information to the money and capital markets in connection with capital decisions and analyzing the future trend of the economy, and as a result, it can influence the reaction of the money and capital market. It brings changes in the dimensions of the level of risk and return. In the past, all monetary policy decisions were made secretly, but in the 1990s, when transparency became the central focus of central banks, a paradigm shift occurred and gradually central banks, including in various Islamic countries, committed to transparency in monetary policy decisions and analysis. their economic conditions. This is despite the fact that the results of some researches conducted in this field indicate that the lack of banking transparency leads to the occurrence of crises, while according to some researches, banking transparency can be desirable (Mehrani, 1400). In this regard, the current research has been carried out with the aim of identifying and determining the importance of transparency of the central bank on the reaction of the capital market in terms of risk and return. At first, based on the content analysis of the research literature, it was attempted to identify the systemic risk measures, the transparency dimensions of the central bank, and the micro and macro economic factors affecting the reaction of the capital market, followed by a Delphi survey of experts. Based on the findings of the research based on the combined method of Delphi and Dimtel Fuzzy, political, economic, procedural, political (policy) and operational transparency are among the criteria introduced for the transparency of the central bank. The results for risk indicate that the components of change in conditional value of risk, exposed value and systemic risk are risk components. The value of the company to the capital, the size of the assets and the liquidity of the assets have been introduced as micro-financial dimensions, and the market efficiency index and the value index of transactions in the stock exchange have been introduced as economic micro-components. Financial instability, investment growth, financial development, GDP growth, price index growth, monetary base and real interest rate are also introduced indicators for macroeconomic components.

However, although our study relies more on researches such as McShane. 2011 and Callahan, Soileau, 2017 have been implemented, comparing the previous researches, especially the mentioned researches, have considered differences:

- During the previous researches, only the criteria of return on investment and return on capital were used alone or only the measure of company value with Q-Tobin scale, while this research used three criteria at the same time. In addition, unlike previous researches that used absolute



performance criteria

- Often, during past researches, one of the dimensions of risk has been used to measure the company's risk management, in other words, indirect measurement. In addition, in the researches that have directly measured the company's risk management, often in researches such as Callahan and Soyla (2017), judgment measures have been used and in a research such as Hosseini, Hosseini and Seyed Motahari (2014), in this The research has been used simultaneously and comparatively from both categories of performance and judgment measures.

References

1. Moazzami, Mehdi, Rasoulia, Mohsen, Vadie Nowghabi, Mohammad Hossein, Arabzadeh, Meysam, Mazroui Nasrabadi, Esmail (2024). Central Bank Transparency and Capital Market Reaction: A Systematic Review. *Advances in Mathematical Finance & Applications*. 9(2), P.588-606.
2. Acharya, V. V., Pedersen, L. H., Philippon, T., Richardson, M., Measuring systemic risk, (2017). *Review of Financial Studies*, 30(1): 2–47. doi:10.1093/rfs/hhw088.
3. Adrian, T., Brunnermeier, M. K., CoVaR, *American Economic Review*, 2016; 106(7): 1705–1741. doi:10.1257/aer.20120555.
4. Afshari, Zahra, & Fatemeh Daraei.(2019). “The Impact of Central Bank Independence on Stock Market Volatility”, *Journal of Money & Economy* 13, no. 4. 423 -441
5. Andrieş, A. M., Nistor, S., Sprincean, N.,(2020). The impact of central bank transparency on systemic Risk-Evidence from Central and Eastern Europe, *Research in International Business and Finance*, 51, Article 100921.
6. Bai, Yan, Jose-Victor Rios-Rull, and Kjetil Storesletten (2017). “Demand Shocks as Productivity Shocks”. In: Unpublished.
7. Baker, S.R; Bloom, N; Davis, S.J; (2016). Measuring economic policy uncertainty. *Q. J. Econ.* 131 (4), 1593–1636.
8. Bisias, D ; Flood, M; Lo, AW (2012); Valavanis, S., A Survey of Systemic Risk Analytics, *Annual Review Of Financial Economics*, Volume 4: 255-296.
9. Blinder, Alan S., Michael Ehrmann, Marcel Fratzscher, Jakob De Haan, and David-Jan Jansen. (2008). "Central Bank Communication and Monetary Policy: A Survey of Theory and Evidence." *Journal of Economic Literature*, 46 (4): 910-45.
10. Broto, Carmen et al.,(2021). How Do Central Banks Identify Risks? A Survey of Indicators (October 1, 2021). Banco de Espana Occasional Paper No. 2125,
11. Callahan, C., & Soileau, J. (2017). Does Enterprise risk management enhance operating performance?. *Advances in accounting*, 37, 122-139.
12. Derakhshideh, Siddiq, Mahmoudi, Sayyed Mohammad and Yazdani, Hamidreza. (2019). Identifying, prioritizing and modeling the factors affecting the implementation of effective



- information technology governance using the fuzzy Delphi method, fuzzy Dimetal and network analysis process. Information processing and management research paper. 35(4): 1012-979 [In Persian].
13. Ehsani, Mohammad Ali, Farzin Vash, Asadullah, Elahi, Nasser and Izadi, Reza. (2018). Extracting the optimal transparency of the central bank to reduce turbulence in the financial markets (a case study of selected member countries of the Organization of Islamic Cooperation. Biquarterly Scientific Journal of Economic Studies and Policies. 6(1): 3-28 [In Persian].
 14. Eijffinger, S. C., Geraats, P. M., (2006). How transparent are central banks? European Journal of Political Economy; 22: 1-21. doi:10.1016/j.ejpoleco.2005.09.013.
 15. Fry, M., DeAnne, J. Mahadeva, L. Roger, S. & Sterne, G. (2000). Key Issues in the Choice of Monetary Policy Framework, In: Mahadeva, L. & Stern, G. (Eds.), Monetary Policy Frameworks in a Global Context, 1.216. Routledge, London.
 16. Habibi, A., F. F. Jahantigh, & A. Sarafrazi. 2015. Fuzzy Delphi Technique for Forecasting and Screening Items. Asian Journal of Research in Business Economics and Management 5 (2): 130-143.
 17. Hansen, S., M. McMahon, and A. Prat. (2017). "Transparency and Deliberation within the FOMC: A Computational Linguistics Approach." Quarterly Journal of Economics 133 (2): 801–70.
 18. Hosseini, Seyyed Abdul Reza; Hosseini, Seyyed Mohammad Hossein; Seyed Motahari, Seyed Mehdi. (2014), the relationship between company risk management and company performance, Accounting Empirical Research, Year 4, Number 13, pp. 45-60 [In Persian].
 19. Husted, L., J. Rogers, and B. Sun. (2020). "Monetary Policy Uncertainty." Journal of Monetary Economics 115 (November): 20–36.
 20. Lee, W. S., A. Y. Huang, Y. Y. Chang, & C. M. Cheng. 2011. Analysis of Decision Making Factors for Equity Investment by DEMATEL and Analytic Network Process. Expert Systems with Applications 38 (7): 8375-8383.
 21. Lustenbergera Thomas, and Rossi Enzo. (2020). Does Central Bank Transparency and Communication Affect Financial and Macroeconomic Forecasts?, International Journal of Central Banking. 16(2): 153-201.
 22. McShane, M., Nair, A., & Rustambekov, E. (2011). Does enterprise risk management increase firm value? Journal of Accounting Auditing and Finance, 26(4), 641–658.
 23. Md. Shahidul Islam & Shin-Ichi Nishiyama, (2016). "The Determinants of Bank Profitability: Dynamic Panel Evidence from South Asian Countries," Journal of Applied Finance & Banking, SCIENPRESS Ltd, vol. 6(3), pages 1-6.
 24. Mehrani, Sasan, Mohammadi, Faezeh. (2020). Investigating the effect of lack of banking transparency on the ability of the supervisory authority to apply the waiver policy. Accounting and auditing reviews. 28(3): 487-506 [In Persian].
 25. Nakamura, E., and J. Steinsson. (2018). "High Frequency Identification of Monetary Non-Neutrality." Quarterly Journal of Economics 133 (3): 1283–1330.



26. Yazdani, Mehdi, Shakoui Dounighi, Rana. (2021). Evaluating the impact of central bank transparency on macroeconomic stability in emerging countries. Economic research paper. 22(84): 103-138 [In Persian].
27. Yazdani, Mehdi, Tayibi, Seyed Kamil, Yazdani, Nafsia. (2014). How does the independence of the central bank affect the financial stability of the economy in emerging market countries? Financial monetary economy. 22(9): 151-132 [In Persian].
28. Zhang, Xiaoming & Liang, Qian & Lee, Chien-Chiang. (2022). How does central bank transparency affect systemic risk? Evidence from developed and developing countries. The Quarterly Review of Economics and Finance.