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Identification and Refinement of Effective Factors of Financial Reporting Transparency of Firms Listed on Iran Stock Exchange

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ABSTRACT

This study aimed to identify effective factors of financial reporting transparency (FRT) of companies using knowledge analysis and selected the final effective factors from them using the ANP analytic network process. In this regard, 16 professors and pundits in financial and reporting areas were selected as the experts. Then, these factors were assessed, refined, and categorized in three survey stages using the Delphi method. First, 20 factors were extracted from the literature review based on the knowledge and content analysis: institutional ownership, independence of the board of directors, the lack of ownership concentration, size of the board of directors, information quality, information accuracy, profit fluctuation, sales margin, return on assets, return on investment, asset turnover, company value, competition, age of the company, size of the company, technology, current ratio, quick ratio, cash flow and asset liquidity. Further, the identified factors were categorized, assessed and refined based on the survey results from the experts' opinions using Delphi and ANP analytic network process methods. Results showed the following 10 out of 20 factors, identified using the content and knowledge analysis, as the effective factors of FRT: institutional ownership and independence of the board of directors (corporate governance mechanisms), information accuracy and profit fluctuation (financial analysis), return on assets and return on investment (financial performance), competition and age of company (environment), and cash flow and asset liquidity (liquidity).

1 Introduction

There are different interpretations of FRT. Some such as Gernon and Meeks [14], defined FRT as revealing information from a channel, except from financial statements and/or annual activity report, such as the press. Finally, such researchers as Bushman et al. [9] emphasized a comprehensive perspective based on the corporate information environment. Some researchers, Barth et al. [7], defined it as the remainder of the regression model based on the total accruals or profit, stock returns, and its changes. A vast number of studies into an FRT measurement criterion concluded that it is a multidimensional

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property of corporate information environment, which cannot be measured directly. Although it is recognized that a company's financial statements audited by one of the major audit institutions is not necessarily transparent, working with a high-quality auditor is an index for identifying companies committed to provide honest and understandable financial information. Ideally, the sufficiency, quality, and validity of provided information should be assessed for measuring FRT; however, due to an information asymmetry between information providers and users, it is almost an impossible task. Therefore, reducing this asymmetry is an important objective of accounting information [23]. The importance of financial transparency (FT) is widely recognized in being accountable to people, investors, and shareholders. The accounting and supervision systems that prepare financial statements, financial reports, and other financial information provide the foundations of financial accountability. Information about the financial performance of a company has improved capital decisions for the investors or the allocation of financial resources by creditors [4]. Regarding FT in the light of economic and financial crises in recent years, growing attention has been given to it. Managers are under pressure for disclosing high-quality financial information to control the mechanism of using organizational resources; in addition, the diagnosis of financial distress and achieving a stable financial equilibrium depend on FT [35]. The development of information and communication technology (ICT) in organizations has provided FT and accountability to stakeholders by developing digital versions and new tools, such as the Internet, for financial information disclosure.

This technological advance has changed the nonactive role of outside stakeholders into more active participation. Moreover, progress in the field of IT allows a greater number of stakeholders, including potential investors to supervise financial and managerial affairs and make the management take measures to reduce costs, involve stakeholders, and provide more FRT. Internet-based reporting has changed the relationship between extra-organizational stakeholders from a passive to active status. Other advantages of information technology development include online access to information so that today the amount of information published on the Internet can be accessed in the same way that it is produced in in-house formats [2]. The environment related to online financial information disclosure may consider this online disclosure desirable; however, technical conditions and accounting limitations may inhibit a vast disclosure of information. As a result, the expectation of accessibility to online reports may vary in different areas because of differences in framework properties and access to the Internet. For example, the access to financial information of organizations via the Internet is less common among rural and low-income populations than in urban and high-income populations [40]. A large part of the research literature is devoted to the study of FT and its determinative factors. In specific, Rodríguez Bolívar et al. [34] were among the researchers who investigated determinative factors of FT in social, economic, political, and organizational dimensions with an impact on FRT. Some of these researchers, such as Arapis and Reitano [6] investigated the effective factors of FRT in relation to government financial reporting; whereas, some other researchers investigated FRT at a micro level. However, none of them identified, categorized, or refined the effective factors of FRT.

The first reason for conducting this study was the lack of academic studies into the integration of distinct criteria and the provision of a multidimensional criterion for FRT to increase the descriptive power of transparency relative to its economic consequences. Therefore, the present research article was done to "Identify and Refine Effective Factors of FRT of Firms Listed on Iran Stock Exchange." Accordingly, the present study was conducted to establish the effects of identifying and refining effective factors of FRT in firms listed on Iran Stock Exchange.

2 Literature Review

This part of the article explains the theoretical basics and concepts, and provides experimental evidence of FRT and its effective factors.

2.1 Indices of Transparency or Financial Transparency

The indices of transparency include several measures, which may inform extra-organizational stakeholders about financial position or performance of the company. The index of financial transparency may include forced and optional items or a combination of them. These indices may target information disclosed by the company itself or by other sources, such as analyzers [19]. Literature review showed broad differences in the creation of this structure. These differences are because of the researcher's intervention in the creation of the index, information transparency, and number of the index's items. They may be due to the measurement method, number of industries, and included countries. For example, since mandatory transparency policy is more common in developing countries than developed countries, the majority of studies in such countries investigated how much relevant regulations are conformed to Hasan et al. [19]. The researcher may use the indices of transparency, transparency in the literature, and/or transparency index of professional organizations. For the first group, Bushman et al.'s study [9] can be mentioned. The transparency index and Standard and Poor's Indices are two examples of these indices. The majority of researchers incline to create indices that fit their studies; however, there are few studies with self-created indices because of the reliance of data collection on human work. Making a decision about the type and number of information units used in the index of transparency or financial transparency is a subjective task.

Accordingly, another potential limitation is due to using these indices for the measurement of the level of financial transparency, that the validity of measurement results depends on the employed index. It is worth noting that the literature ignored the relationship between information units in the creation of financial transparency index. This results in ignoring excess information content caused by each information unit included in the index [14]. The corporate reporting channel, the risk criterion and investment opportunity are added to the model due to their importance in valuing the company. Many studies, such as Amihud and Mendelson's [5], has emphasized the role of risk. Hassan and Marston [18] concluded that the corporate beta reduces with increasing the corporate transparency based on the Standard and Poor's index; in addition, the abnormal return moderated for the risk and earnings response coefficient also increases.

2.2 Financial Transparency Measurement

There also two transparency dimensions in the FRT measurement: 1) FRT at capital market level, and 2) FRT at a macro level or country-wide level. The measurement of accounting transparency at a macro or country-wide level refers to the transparency imposed on companies under market pressure and relates to the measurement of relevant laws and accounting systems. Since every company operates under the accounting systems and law of the respective country, these accounting systems and laws indicate the minimum FRT of the companies in that country. As was mentioned earlier, the second dimension refers to the FRT at each company's level. Although, accounting systems and laws are similar in all countries, they have different levels of FRT. Kim, [23]. The one-dimensional and multidimensional criteria were used to assess FRT. Since one-dimensional criteria are structures with transparency meas-

urement error, many researchers, such as Bushman et al. [9] and Lang et al. [24] have designed comprehensive criteria of transparency to measure different dimensions of FRT. Regarding that all one-dimensional criteria are direct and most likely independent indices of FRT, multi-dimensional criteria can enhance explanatory power of the measure. Moreover, previous studies, such as Lang eta al.'s [24], have shown that the extraction of causal relationships based on one-dimensional indices of transparency was associated with great errors; however, considering these indices as a group is a more suitable criterion for the company's commitment to high quality of FT and general quality of information environment. Therefore, the Bushman et al.'s definition [9], which covers a broad range of transparency-related concept, was used in the current study for a broad assessment of the company's transparency in the national information environment. Based on their definition, transparency is achieved through three different channels:

Table 1: Bushman et al. [9]

Information distribution channel	Information acquisition and private communication channel	Corporate reporting channel
hhe mediaee eœorss about company	Amount of follow-up work by analyst	FT indices
		Corporate governance transparency
		Accounting principles
		Timely
		Reliability

The literature review showed that in suc tsudies sa hte Bushman tal.'s [9], Barth et al.'s [7], Hassan et al.'s [19], and Lang et al.'s [24], some indirect one-dimensional indices of transparency have been mentioned at the corporate level. Some of these transparency indices are developed by the researchers or professional organization associations. In this regard, profit quality and management, descriptive power of profit, relationship of profit and return, quality of accounting standards, quality of auditor, properties of information become transparent by analysts, and properties of managers' profit prediction have been mentioned. The transparency indices typically address four dimensions, namely quantity, quality, properties of information disclosed to specific people like analysts and institutional owners, and information disclosed by the media. This study addressed some of the most important indices, including Bushman et al.'s study [9], which measure information transparency at the corporate level based on quantity, quality of information disclosed by the company, and final transactions.

There are some studies into the effect of each effective factor of FT on different dimensions or components of transparency at the local governmental level without assessing general transparency. Grimmelikhuijsen and Feeney [16] developed and examined an integrated framework to form an open government at the level of local governments. This study was conducted based on the content analysis of governmental websites of 500 cities. During this study, FT was measured in three dimensions and as a dependent variable. The three-fold dimension of FT are access to financial transparency, reporting transparency, and participation of stakeholders. This study investigated the effects of organizational capacity, technological capacity, concentration, innovation, procedures, open procedures for participation, and competition as effective factors of FT and descriptive variables. Bearfield and Bowman [8] in a similar study investigated official websites of cities with at least 10,000 populations in Texas. During this study, FT was measured in four dimensions and as a dependent variable. These dimensions are as

follows: 1) financial and budget information, 2) human resource information, 3) physical assets information, and 4) general information. This study used content analysis employing many indices for each dependent variable for data analysis. The governmental resources, political competition, office and professional factors, demand of society, and organization are effective external factors of FT or descriptive variables.

2.3 Effective Factors of Financial Transparency

have investigated some of these factors based on such financial theories as agency theory, signaling theory, and economic firm theory. For example, Pina and Torres [30] investigated corporate governance mechanisms based on the agency theory. Some other researchers, such as Fazzari et al. [13] and Reddick et al. [33], indicated the accuracy and quality of information and quality of financial reporting, and predictions of financial analysts based on the information advantage theory and signaling theory. Some researchers addressed inter- and intra-organizational environment factors in strategic and organizational fields based on the management theories. Lang et al., [24]. Finally, some studies, such as the Kim's [23]. The literature review showed that effective factors of FT were investigated at the macro level (central or local governments) and micro level (company). Since 1970, some studies have been done to determine the effective factors of FT at the macro level (central and local governments) in collaboration with economic, accounting, financial management, legal, politics, and organizational researchers. Recent studies have investigated FT in following specialized areas: governmental office, information systems, and e-government.

These studies investigated the effective factors of online transparency of information and the way e-government can affect convergence with accountable governmental organization Pina et al. [30]. The importance of effective factors of FT has been approved by many pundits and experts in different political areas [6]. Discussion about the roots and evolution of studies into the effective factors of FT is beyond the scope of this paper. In general, these studies investigated different governmental levels, namely central governments, state or regional governments, and local governments. Nevertheless, there is a general agreement in studies about the dependence of FT on different underlying factors. Alcaide Muñoz et al., [2]. There are many studies at the micro-level (company) to determine the effective factors of FRT. Some studies investigated cash measures and cash flow based on the theory of liquidity and free cash flow. there is a positive and significant relationship between the value content of accounting information and reporting quality of financial information [36]. The relationship between comparing financial statements as a qualitative feature of financial reporting with the expected risk of a stock price crash has been explored. The results of the hypothesis test showed that there is a significant and negative relationship between the comparison of the financial statements and the projected fall in the stock price. Pasandideh et al, [31]. The relationship between board members' financial incentives and corporate risk disclosure has been emphasized in terms of firm performance and risk in Iran.

According to regression results, board members' financial incentives affect quality and expanding corporate risk disclosure [15]. Chung et al. Examined the factors affecting the transparency of companies' information from two dimensions in 2012: the intensity of technology and institutional ownership. They found that increasing domestic institutional ownership for advanced industrial firms relative to foreign institutional ownership leads to improved information transparency this year. Their results show that institutional shareholders promote corporate governance practices that are gradually accelerating. High-tech development is improving [11] eIn an article on board and transparency and financial disclosure. They examined the relationship between board composition (ratio of independent directors, board size,

CEO duality) and financial transparency and information disclosure. Using multiple linear regression analysis, they analyzed the composition of the board and the financial research and development of the listed companies in Italy and concluded that there is a significant relationship between the composition of the board and the level of transparency. In particular, the authors found a positive and significant relationship between the ratio of independent managers and the level of financial transparency and a negative relationship between the size of the board and the level of financial transparency [38]. In a study, Madhani examined the relationship between concentration of ownership, corporate governance, and disclosure practices: companies listed on the Bombay Stock Exchange. Accordingly, this study provides empirical evidence of such a relationship for the sample companies listed on the Bombay Stock Exchange and found that the holdings' assets have a negative but negligible relationship with corporate governance and corporate disclosure practices [29].

The results of Salehi et al.'s research also show that institutional ownership in organizational companies affects and adjusts the relationship between tax structure and capital. salehi et al.'s [3] Manuel et al. Found that, on average, strong-governance firms appear to use discretionary accruals to inform investors about bad news in a timelier manner [22]. The results of research by Chang et al. Show that corporate governance has a negative mediating effect on the relationship between firm performance and risk both during and after the financial crisis. Therefore, it acts as a risk protector to protect companies. Their empirical results show evidence that listed companies in Taiwan report with higher levels of corporate governance, high corporate performance, and low corporate risk. Based on the findings, they recommend that decision makers, in terms of value creation and risk control, formulate corporate governance strategies, with special attention to participation in annual public meetings, division of chairman and CEO, composition of the board, remuneration of the manager. Focus on discipline, ownership information and transparency of the board structure [10]. Tzung et al. Showed that information transparency and accounting quality are not closely related. Their empirical findings suggest that greater transparency and greater disclosure with accounting quality in financial reporting proxies may be important when establishing an information evaluation system [39]. Yousefi Asl et al. In a study entitled "Explaining the model of financial reporting transparency" considered several factors, including profit forecasting accuracy, timeliness and reliability of financial reporting as factors affecting financial transparency [41]. Hajiha et al. In their research found that managers, as responsible for preparing financial statements, are always motivated to distort financial information to protect their interests.

Findings show that lack of profit transparency and profit instability have a positive and significant effect on the risk of falling stock prices [17]. John et al. Examined the effect of profitability versus nonprofit on the financial transparency of companies engaged in the procurement of public goods. They found that financial transparency was positively related to profitability. Their results have attracted the attention of many researchers interested in the role of transparency and transaction costs in the market versus financing. John et al, [21]. First calculated the level of transparency of financial information disclosure in corporate governance reports and annual reports by creating a transparency checklist. They then performed a MANOVA analysis to examine the relationship between the calculated level of transparency and the financial ratios. The results of their research show that the level of transparency is statistically different between the variables of return on assets, total debt / total assets, long-term debt / total assets and corporate governance index [1]. Found that disclosure managers volunteered to reduce information risk and increase stock prices, but at the same time tried to avoid disclosing disclosure records that were difficult to maintain [20]. The results of Omaima al.'s research show that there is a complex interaction

of various factors that determine the relationship between disclosure and company value [19]. According to studies Gugler, transparency is one of the main issues in competition policy. High or low transparency as well as information asymmetry occurs at several levels, at the level of companies and other companies up or down. Level of producers / sellers and consumers. Level of companies and antitrust authorities / regulations. In the case of anti-monopoly practices, it is the authorities who must find the right level of transparency and therefore apply the "optimal transparency" regime. Some industries are more transparent than others and cannot be artificially regulated to reduce transparency. Any attempt to reduce transparency can cause negative side effects that may be more detrimental to society. Gugler [32] Using reporting under internationally recognized accounting standards (IFRS or U.S. GAAP) as our measure of reporting transparency, we find that following a transparent accounting framework decreases cartel duration. We show this finding is partly explained by transparent segment disclosure, which provides a means for the verification of agreed-upon sales for a product or region. Consistent with the view that transparent reporting leads to earlier detection of deviating members, we further show that transparency lowers cartel duration when the likelihood of cheating is high.
Igor Goncharov et al, [25]. Arsov & Bucevska in their research, they concluded that transparency is positively correlated with firm size and the need for external financing, but negatively with a focus on ownership. They did not find a statistically significant relationship between transparency and profitability [37]. Michele et al. Found that efficiency, transparency, and information availability increased as a result of the use of digital technologies. [12]. Mohammadi et al. Examined the relationship between corporate transparency and restrictions on the financing of companies listed on the Tehran Stock Exchange. To measure the transparency of the company, two criteria of transparency of accounting profit and discretionary accruals were used and to determine the companies that have limited funding, the localized KZ index was used. Findings show that corporate transparency has a significant relationship with financing constraints, which indicates that companies that are better off in terms of corporate transparency will face less constraints in terms of financing [28]. Marco et al. Provided a model in which asset-backed securities issuers decide to publish large amounts of information to increase their primary market liquidity at the expense of reducing secondary market liquidity. If the social value of secondary market liquidity is greater than its private value, the degree of transparency is inefficient. They showed that different types of public intervention (standards of mandatory transparency, providing liquidity to needy banks, or supporting secondary market prices) have completely different welfare outcomes [26]. Mark et al. Examined the relationship between firm-level transparency, stock market liquidity, and valuation, and focused on whether this relationship varies according to firm characteristics and the economic environment. In their view, greater transparency is measured by less evidence of earnings management, better accounting standards, higher quality auditors, more analysts. When the overall uncertainty of the investor is greater, transparency at the company level is more important. The final analysis showed that liquidity is an important channel through which transparency affects the company's valuation and the cost of capital stock [27].

3 Research Method

Due to contributing to literature review and providing the context for making more efficient decisions in the capital market, this was a theoretical and applied study with a survey design because of using the Delphi and ANP analytic network process methods. The descriptive deduction method was employed due to using knowledge and content analysis for the identification of effective factors and exploiting multicriteria method and Delphi method for surveying the experts selected non-randomly. Due to using

a qualitative method for the identification of the factor on the one hand, and refining factors based on the qualitative fuzzy logic and multicriteria, the mixed method was used for data analysis.

3.1 Selection of Experts

After the identification of effective factors of FT based on the knowledge and content analysis, these factors were assessed by surveying the opinions of the experts and using multicriteria ANP analytic network process. Finally, there were 16 selected experts who announced their readiness. The experts met the following conditions:

1) Specialized and highly educated professors in financial, auditory, and accounting areas
2) People with professional experience in financial and accounting areas
3) People with research background on financial and accounting areas
4) People ready to take part in the survey on the importance and effects of each effective factor of FRT

3.2 Data Analysis Methods

in this study, the knowledge and content analysis methods were used for data analysis to identify effective factors of FRT; in addition, the experts were surveyed, using the Delphi method and ANP analytic network process, to categorize, assess, and refine those factors. The Delphi survey method was regarded as a tool to support and develop studies, and data was completed with other tools and techniques. Delphi is a method for acquiring group knowledge. It is a process with a predictive structure, which is helpful for decision-making during survey and data collection stages and finally achieving group consensus; whereas, the majority of surveys try to answer "what is it?", Delphi responds to "what it can/should be?" Delphi is based on the respondents' views. In this technique, verbal statements are used to assess the views.

4 Research Findings

Based on the literature and the content and knowledge analysis, the effective factors of FRT of the companies were identified. In addition, the final effective factors, as independent or descriptive variables, were selected using the multi criteria ANP analytic network process.

4.1 Identification of Effective Factors of FT

In this study, an exploratory model was used to investigate the effective factors of FRT within the research scope. As a result, the identification and categorization of effective factors of FRT in companies were done based on the literature review, content analysis, and knowledge analysis. Table 2 represents a summary of results related to the identification and categorization of effective factors of FRT.
The effective factors of FRT were divided into following five groups: The mechanisms of corporate governance (institutional ownership, independence of the board of directors, lack of ownership concentration, and size of the board of directors), financial analysis (information quality, information accuracy, and profit fluctuation), financial performance (sales margin, return on assets, return on investment, asset turnover, company value), environment (competition, age of company, size of company, technology), and finally liquidity (current ratio, quick ratio, cash flow and asset liquidity).

4.2 Selection of Experts

The key characteristic of the experts in this study was adequate relevant knowledge. These experts should have at least a master's degree and been actively involved in financial reporting. Based on the inclusion criteria, 16 eligible experts were selected using nonprobability sampling and judgment sampling. The expert group was comprised of 16 experts in following areas and companies: 1. faculty members of university (n=8), 2. senior managers and experts of companies listed on Iran Stock Exchange (n=7), and 3. other pundits in the area of FT (n=4).

4.3 Fuzzification Equations

The research questionnaire was derived aiming to measure the experts' agreement with the components and dimensions. To this end, the experts scored their agreement with each component on a five-point Likert scale anchored by very low, low, moderate, high, and very high. These variables were defined using triangular fuzzy numbers. Table 2 represents triangular fuzzy numbers of verbal variables. In this table, crisp fuzzy numbers were calculated using the Minkowski equation (2001) as follows:

$$x = a_1 + \frac{a_3 - a_2}{4}$$

Table 2: Triangular Fuzzy Numbers of Verbal Variables

Verbal variables	Triangular fuzzy numbers (a_1, a_2, a_3)	Crisp (x)	Verbal variables	Triangular fuzzy (a_1, a_2, a_3)	Crisp fuzzy number (x)
Very low	(0.25, 0, 0)	0.0625	High	(1, 0.75, 0.5)	0.5625
Low	(0.5, 0.25, 0)	0.0625	Very high	(1, 1, 0.75)	0.75
Moderate	(0.75, 0.5, 0.25)	0.3125			

4.4 First Stage of Survey

To investigate the sufficiency of components extracted from the literature and categorization assessed in previous stage, 5 out of 16 experts were interviewed. To this end, and open-ended questionnaire was distributed among them. By careful examination of their opinions and suggestions, along with results from interviews and questionnaires and their summaries, the adequacy of these components was confirmed. In this stage of the fuzzy Delphi, the components were categorized based on the experts' opinions. Moreover, the required modifications were made to the components based on corrective comments of the experts.

4.5 Second Stage of Survey

In this stage, the research questionnaire was developed, using the components derived from the literature and recommendations of the experts in the first stage, and delivered to the selected experts (n=16) and they were asked to give their opinions about each component through verbal variables in the questionnaire. The fuzzy mean of each component was calculated using the results for the questionnaire and following equations. Moreover, the defuzzification was calculated using following equation.

$$A^i = \left(a_1^i . a_2^i . a_3^i\right)\ i = 1.2.3. \ldots . n$$

Where, Ai represents the opinion of ith expert and n represents the number of experts whose mean is calculated with following equation. In this equation, am is the mean value of the experts' opinion.

$$A_m = (a_{m1} . a_{m2} . a_{m3}) = (\frac{1}{n}\sum_{i=1}^{n} a_1^i . \frac{1}{n}\sum_{i=1}^{n} a_2^i . \frac{1}{n}\sum_{i=1}^{n} a_3^i)$$

Based on the defuzzified mean value, the components with very low mean score were removed. In this study, scores between 0 and 0.2 was regarded as very low based on the experts' recommendations.

4.6 Third Stage of Survey

Previous opinions of each expert and their difference with other experts' opinions, along with the new questionnaires were delivered to all expert group members again and their responses in the third stage were analyzed similar to the first stage using above equations. If the difference between two surveys was less than the very low threshold (e.g. 0.1), the survey process would be stopped. As a result, the difference in the experts' opinion between the second and third stages was determined. According to the results from this stage, the difference in experts' opinions between the second and third stages for all success components were lower than very low threshold (0.1). As a result, the survey was stopped in this stage. During three survey stages using the Delphi method, the importance of 20 factors was determined from the experts' views.

Table 3: Paired Comparison of Corporate Governance to Financial Performance Dimensions

Component		Corporate governance				Financial performance					Weights
		INS_{it}	**IND_{it}**	**NCO_{it}**	**BSI_{it}**	**MAR_{it}**	**ROA_{it}**	**ROE_{it}**	**AST_{it}**	**QTB_{it}**	
Corporate governance	INS_{it}	1.0000	0.3824	0.5280	0.3814	0.5081	0.4980	0.4980	1.1148	0.4852	0.1636
	IND_{it}	2.6150	1.0000	0.6545	0.6057	0.4764	0.5322	0.6443	0.5889	0.4769	0.1519
	NCO_{it}	1.8940	1.5280	1.0000	0.5005	0.6502	0.4838	0.5133	1.1274	1.0438	0.1035
	BSI_{it}	2.6220	1.6510	1.9980	1.0000	0.4864	0.4719	0.4766	0.6158	0.5018	0.0811
Financial performance	MAR_{it}	1.9680	2.0990	1.5380	2.0560	1.0000	1.1186	1.0010	0.9363	0.9183	0.0841
	ROA_{it}	1.8870	1.8790	2.0670	2.1190	0.8940	1.0000	0.6293	1.1641	1.3717	0.1339
	ROE_{it}	2.0080	1.5520	1.9480	2.0980	0.9990	1.5890	1.0000	0.3712	0.7899	0.1260
	AST_{it}	0.8970	1.6980	0.8870	1.6240	1.0680	0.8590	2.6940	1.0000	0.9756	0.0850
	QTB_{it}	2.0610	2.0970	0.9580	1.9930	1.0890	0.7290	1.2660	1.0250	1.0000	0.0708

Second stage: normalization of comparisons

4.7 Determining Relative Importance of Factors and Refining Them

Further, the analytic network process (ANP) was used in following regular stages to determine the relative importance of each effective factor of FT. First stage: paired comparisons of FT components
In this stage, the weights of the components of each five dimensions were determined similar to the AHP method. Moreover, the paired comparisons were used to show the internal correlation between the components of each dimension. The priority weights of each dimension's components were used to form unweighted supermatrix. For example, Table 3 presents result from the paired comparison of relative importance of corporate governance's dimension relative to financial performance components based on the opinions of 16 experts. The unweighted supermatrix in this study was multiplied by the

priority weights of five key dimensions of the control matrix. In this way, a supermatrix with total sum of the elements in each column equal to 1 was obtained and then the limited supermatrix was calculated. In the present study, the Super Decisions was used to calculate the limited supermatrix. The results from the normalization of importance coefficients of each effective factor of FRT in the paired comparison are presented in Table 4.

Table 4: Structure of Control Matrix for Paired Comparison of Dimensions Based On Dependency Equations

Relative to corporate governance						
Component	Corporate governance	Financial analysis	Financial performance	Environmental	Liquidity	Weights vector
Corporate governance	1	1.429	1.628	0.659	0.795	0.251
Financial analysis	0.859	1	0.796	1.225	0.892	0.161
Financial performance	1.581	0.681	1	1.265	1.339	0.268
Environmental	1.362	0.982	1.591	1	1.059	0.178
Liquidity	1.356	0.791	0.691	0.758	1	0.142
Relative to financial analysis						
Corporate governance	1	1.436	1.618	0.672	0.779	0.250
Financial analysis	0.851	1	0.725	1.221	0.901	0.163
Financial performance	1.573	0.683	1	1.276	1.336	0.267
Environmental	1.302	0.992	1.599	1	1.059	0.179
Liquidity	1.369	0.796	0.702	0.766	1	0.141
Relative to financial analysis						
Corporate governance	1	1.441	1.612	0.670	0.774	0.251
Financial analysis	0.852	1	0.715	1.229	0.892	0.164
Financial performance	1.569	0.691	1	1.278	1.334	0.268
Environmental	1.309	0.993	1,598	1	1.059	0.177
Liquidity	1.376	0.802	0.700	0.764	1	0.140
Relative to environment						
Corporate governance	1	1.446	1.615	0.675	0.765	0.256
Financial analysis	0.854	1	0.718	1.229	0.893	0.160
Financial performance	1.573	0.698	1	1.279	1.333	0.270
Environmental	1.312	0.995	1.605	1	1.061	0.177
Liquidity	1.375	0.779	0.712	0.772	1	0.137
Relative to environment						
Corporate governance	1	1.442	1.612	0.677	0.767	0.255
Financial analysis	0.859	1	0.719	1.230	0.895	0.161
Financial performance	1.507	0.697	1	1.281	1.331	0.272
Environmental	1.316	0.996	1.607	1	1.059	0.176
Liquidity	1.377	0.781	0.714	0.770	1	0.136
Control matrix						
Corporate governance	0.251	0.250	0.251	0.256	0.255	
Financial analysis	0.161	0.163	0.164	0.160	0.161	
Financial performance	0.268	0.267	0.268	0.270	0.272	
Environmental	0.178	0.179	0.177	0.177	0.176	
Liquidity	0.142	0.141	0.140	0.137	0.136	

Third stage: determining ultimate importance of factors

It is worth noting that the limited supermatrix elements should be normalized. In other words, total sum of its column elements should be equal to 1 to achieve a random-probabilistic state. The normalized

limited supermatrix and the weights of ultimate importance of each component of each dimension (corporate governance, financial analysis, financial performance, environmental performance, and liquidity performance) are presented in Table 5.

Table 5: Obtained Results

Component		Corporate governance				Financial analysis		
		INS_{it}	IND_{it}	NCO_{it}	BSI_{it}	QTB_{it}	IAC_{it}	VOL_{it}
Corporate governance	INS_{it}	0.054	0.054	0.054	0.054	0.054	...	...
	IND_{it}	0.055	0.055	0.055	0.055	0.055	...	...
	NCO_{it}	0.044	0.044	0.044	0.044	0.044	...	...
	BSI_{it}	0.044	0.044	0.044	0.044	0.044	...	...
Financial analysis	QTB_{it}	0.035	0.035	0.035	0.035	0.035	...	...
	IAC_{it}	0.043	0.043	0.043	0.043	0.043	...	...
	VOL_{it}	0.043	0.043	0.043	0.043	0.043	...	...
Financial performance	MAR_{it}	0.041	0.041	0.041	0.041	0.041	...	...
	ROA_{it}	0.072	0.072	0.072	0.072	0.072	...	...
	ROE_{it}	0.065	0.065	0.065	0.065	0.065	...	...
	AST_{it}	0.061	0.061	0.061	0.061	0.061	...	...
	QTB_{it}	0.043	0.043	0.043	0.043	0.043	...	...
Environment	COM_{it}	0.059	0.059	0.059	0.059	0.059	...	...
	AGE_{it}	0.043	0.043	0.043	0.043	0.043	...	...
	SIZ_{it}	0.055	0.055	0.055	0.055	0.055	...	...
	TEC_{it}	0.042	0.042	0.042	0.042	0.042	...	...
Liquidity	CUR_{it}	0.041	0.041	0.041	0.041	0.041	...	...
	RAR_{it}	0.043	0.043	0.043	0.043	0.043	...	...
	CFO_{it}	0.062	0.062	0.062	0.062	0.062	...	...
	ASL_{it}	0.055	0.055	0.055	0.055	0.055	...	...

Table 6: Weights of Final Importance, Prioritization of Effective Components and Dimension on Financial Transparency

Dimensions	Dimension weight	Rate	Components	Symbol	Component weight	Component rank in dimension
Corporate governance	0.255	2	Institutional ownership	INS_{it}	0.054	2
			Independence of board of directors	IND_{it}	0.055	1
			Non-concentrated ownership	NCO_{it}	0.044	3
			Size of board of directors	BSI_{it}	0.044	4
Financial analysis	0.161	4	Quality of information	QTB_{it}	0.035	3
			Accuracy of information	IAC_{it}	0.043	1
			Profit fluctuations	VOL_{it}	0.043	2
Financial performance	0.272	1	Sales margin	MAR_{it}	0.041	5
			Return on assets	ROA_{it}	0.072	1
			Return on investment	ROE_{it}	0.065	2
			Asset turnover	AST_{it}	0.061	3
			Company value	QTB_{it}	0.043	4
Environment	0.176	3	Competition	COM_{it}	059/0	1
			Age of company	AGE_{it}	0.043	3
			Company's size		0.055	2
			Technology	TEC_{it}	0.042	4
Liquidity	0.136	5	Current ratio	CUR_{it}	0.041	4
			Quick ratio	RAR_{it}	0.043	3
			Liquidity fluids	CFO_{it}	062/0	1
			Asset liquidity	ASL_{it}	0.055	2

Fourth stage: determining weights of independent dimension's components
Finally, the weights of ultimate importance and prioritization of dimension and effective factors of FT are presented in Table 6. As is summarized in Table 6, in refining effective factors using the multicriteria method, 10 out of 20 factors (institutional ownership, independence of board of directors, non-concentrated ownership, size of board of directors, quality of information, accuracy of information, profit fluctuations, sales margin, return on assets, return on capital, asset turnover, value of company, competition, age of company, size of company, technology, current ratio, quick ratio, cash flows, and asset liquidity) identified using the content analysis and knowledge analysis were as follows: Institutional ownership and independence of the board of directors (corporate governance mechanisms), information accuracy and profit fluctuation (financial analysis), return on assets and return on investment (financial performance), competition and age of company (environment), and cash flow and asset liquidity (liquidity). These factors were regarded as effective factors of FRT and descriptive variables in the determination of the relationship between FRT and its effective factors.

5 Conclusion

There are different interpretations of FRT, such as Gernon and Mic [14], defined FRT as releasing information from a channel, except from financial statements and/or annual activity report, such as the press. Finally, such researchers as Bushman et al. [9] emphasized a comprehensive perspective based on the corporate information environment. Some researchers, such as Barth et al. [7], defined it as the remainder of the regression model based on the total accruals or benefit, stock returns, and its changes. A vast number of studies into a criterion for the measurement of FRT concluded that it is a multidimensional property of a corporate information environment, which cannot be measured directly. Although it is accepted that a company's financial statements audited by one of the major audit institutions is not necessarily transparent, working with a high-quality auditor is an index for identifying companies committed to provide honest and understandable financial information. Ideally, the sufficiency, quality, and validity of provided information should be assessed for measuring FRT. However, due to information asymmetry between information providers and users, it is almost an impossible task; therefore, reducing this information asymmetry is an important objective of accounting information [23].
This study identified effective factors of corporate FRT using knowledge analysis and selected the final effective factors using the ANP analytic network process. In this regard, 16 professors and pundits in the field of finance and reporting were selected as the experts. Then, these factors were categorized, assessed and refined in three survey stages using Delphi method. First, 20 factors were extracted from the literature review based on the knowledge analysis and content analysis: Institutional ownership, independence of the board of directors, lack of ownership concentration, size of the board of directors, information quality, information accuracy, profit fluctuation, sales margin, return on assets, return on investment, asset turnover, company value, competition, age of company, size of company, technology, current ratio, quick ratio, cash flow and asset liquidity were identified. Further, the identified factors were categorized, assessed and refined based on surveying the experts using Delphi and ANP analytic network process methods. Results introduced following 10 out of 20 factors identified using the content and knowledge analysis as the effective factors of FRT: Institutional ownership and independence of the board of directors (corporate governance mechanisms), information accuracy and profit fluctuation (financial analysis), return on assets and return on investment (financial performance), competition and age of company (environment), and cash flow and asset liquidity (liquidity). This was a theoretical and

applied study with a survey design because of using the Delphi and ANP analytic network process methods. The descriptive deductive method was employed due to using knowledge and content analysis for the identification of effective factors and exploiting multicriteria method and Delphi method for surveying the experts selected non-randomly. Due to using a qualitative method for the identification of the factor on the one hand, and refining factors based on the qualitative fuzzy logic and multicriteria, the mixed method was used for data analysis. Based on the results of the research, other researchers are recommended to conduct research in the following areas:

1)In the present study, in order to refine the effective factors, the judgment method of Delphi survey and ANP has been used. Other researchers are recommended based on simulation models such as genetic algorithm, decision tree and similar cases or neural networks and other models based on data. Perform empirically select factors

2) In this study, to measure the transparency of financial reporting, the models of Kasnik and Barth et al. [7] have been used. Other researchers are advised to use the models of Jones, Modified Jones, Decho and Dicho, the pattern of changes in working capital of Chaudhry et al. or other similar models

3) In this study, to explain the relationship between financial reporting transparency and the factors affecting it, composite linear regression based on panel data analysis was used. This pattern depends on assumptions such as the normality of the distribution, even independent variables, and explanatory factors. Other researchers are advised to use Fama-McBeth regression or spatial regression that provide dynamic analysis and are not dependent on these assumptions.

4) In this study, the effect of macro variables such as government policies (level of capital market protection, reporting reporting regulations and the like), the conditions of foreign sanctions, inflation, exchange rates, employment levels, money supply and other similar cases Ignored. Other researchers are advised to consider the effects of macro variables on the relationship between financial reporting transparency and the factors affecting it through trend analysis techniques.

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