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Determining the importance of the variables influencing financial reporting quality using the fuzzy analytic hierarchy process

Alireza Eghbali Amooghin[a], Heydar Mohammadzadeh Salteh[a,*], Mahdi Salehi[b], Ali Akbar Nonahal Nahr[c]

[a]*Department of Accounting and Management, Marand Branch, Islamic Azad University, Marand, Iran*
[b]*Faculty of Accounting, Ferdowsi University of Mashhad, Mashhad, Iran*
[c]*Department of Accounting, Bostan Abad Branch, Islamic Azad University, Bostan Abad, Iran*

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Abstract

The main goal of this study was to determine the weights of variables affecting financial reporting quality in Iran using the analytic hierarchy process based on fuzzy logic. First, the cause and effect relationship between factors was identified using the DEMATEL method. According to this analysis, the most important variables of reporting quality are information disclosure, management ability, corporate governance, audit committee, audit quality, information asymmetry, internal control system, stock exchange rules and regulations, and conflict of interest. The importance of these variables was determined using the fuzzy analytic hierarchy process. In general, management ability is the most important financial reporting variable, and audit committee and conflict of interest are also important. Management ability is also very important to audit quality, information disclosure, corporate governance, and internal control system. The audit committee and conflict of interest are very important to information disclosure and the internal control system, respectively. A noteworthy point in this study is that the role of network relationships was such that the corporate governance variable showed itself to be completely dependent on management ability.

Keywords: Financial reporting quality, management ability, audit committee, conflict of interest, prioritization, Fuzzy Analytic
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1 Introduction

Financial reporting is intended for providing the financial information helping users in decision-making [4]. Thus, the basic purpose of financial reporting is effectively presenting information to external individuals. The financial reporting information is an essential subject for people basing their actions on it. Poor-quality information in financial reporting can lead to making the wrong decisions [10]. Since it is a multidimensional concept, there is no agreed-upon definition for financial reporting quality [41].

*Corresponding author
Email addresses: alireza.egbali@gmail.com (Alireza Eghbali Amooghin), alireza.egbali@gmail.com (Heydar Mohammadzadeh Salteh), mehdi.salehi@um.ac.ir (Mahdi Salehi), anonahal@gmail.com (Ali Akbar Nonahal Nahr)

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With this in mind, relevance and honest presentation are two fundamental qualities in financial reports, and its four enhancing qualities include comparability, verifiability, promptness, and comprehensibility [13].

Relevance refers to the nature and importance of reported information as omitting or misrepresenting important information affects decision making. An honest statement means presenting comprehensive and neutral financial information without errors [38].

The comparability characteristic means that the financial report's users should be able to compare various aspects of one business and different businesses at one point or over time. The verifiability characteristic ensures that assigning report preparation to another person would yield the same result. The promptness characteristic means to provide the report to all stakeholders in a timely manner to meet decision-making objectives. Furthermore, the comprehensibility characteristic means that information producers have classified, described, and presented the information clearly and concisely [13].

Therefore, there is an emphasis on producing transparent financial reports that help users make better decisions. Naturally, characteristics such as accuracy and predictability can be mentioned for high-level financial reports [21].

Financial reporting quality means that financial statements can present information on business activity and to specifically project expected cash flows to investors and the usefulness of financial statements to investors, creditors, shareholders, managers and other users of the company's financial information. Providing high-quality financial information raises the confidence of company investors and shareholders, increasing the market value of companies [27].

Therefore, the value of financial reporting is dependent on quality. Financial reporting quality is observed around evidence such as disclosing transactions, selecting and applying accounting practices, and providing the necessary information for judgments and decision-making. Generally, the quality characteristics of reporting ensure responsibility and help decision-making. Some quality characteristics refer to the information content of financial reports while others refer to its presentation [31].

At the same time, a company with correct and accurate financial statements but old information loses its efficiency. Timely information in financial reporting allows decision makers to correctly analyze the information and predict the future of their investment [45].

Also, timely financial reporting by the public sector can benefit citizens, tax payers, and other members of society since all financial information users refer to timely information for decision-making. The literature suggests that increasing the quality of financial reporting in this sector improves the performance and efficiency of public institutions, saves costs in the country, and raises civil demands [30].

Raising financial reporting quality is an instrument for fulfilling the responsibility of meeting the needs of society and various stakeholders. Like any other phenomenon, financial reporting quality, which is in line with managing accounting standards and audit quality [27], requires adopting the necessary executive measures and solutions.

To make the company competitive in the field of business and social responsibility, managers should pay attention to financial reporting quality and facilitate its attainment. What makes the work of auditing institutes worthwhile is that they skillfully identify inappropriate information and produce a reliable financial report by maintaining independence, controlling managers' biased manipulations, and adopting the right procedures. Therefore, following a certain model and framework and using independent auditors to complete the information increases the quality assurance of financial reporting, both of which depend on the organization's will. According to Saeedi et al. (2016), to maintain the organization's credibility in society, audit institutions and the organization together strive to produce correct financial reports.

One goal of reporting financial information is to facilitate capital allocation in the economy, an important aspect of which is to improve investment decisions. In particular, theories suggest that improving financial transparency resolves investment issues [42].

Improving financial reporting quality reduces the corruption perception index, indicating the positive role of accounting in corruption, and increases corruption control and accountability, which are indicators of the positive role of accounting in corruption [5].

If a reporting error occurs, the audit trustees will immediately try to correct to prevent problems for the company. Audit committees have the same professional skills as corporate lawyers and tend to communicate effectively with them to solve problems with legal consequences [26].

Like any other issue, financial reporting quality is not accidental, and to reach a desirable level, the relevant factors and variables affecting this phenomenon require certain measures. The factors and their prioritization in policy-making to achieve high-quality financial reporting is among the subjects that have intrigued business managers, experts, and researchers.

This study considered the relationship and the weighted effect of internal and external factors and variables, including information disclosure, audit quality, management ability, internal control system, conflict of interest, corporate governance, information asymmetry, audit committee, and stock exchange rules and regulations with each other and with financial reporting quality. Therefore, this study seeks to answer the following questions:

- What is the cause and effect relationship of the variables affecting financial reporting quality?
- What is the weighted importance of each variable affecting financial reporting quality?

This study first explained financial reporting quality variables in the context of literature review, and then presented the domestic and foreign literature explaining the connection between variables and financial reporting quality. The research methodology, data analysis, and finally, the conclusion and recommendations, are presented in the following.

2 Literature Review

According to the literature, there are various factors involved in producing a good financial report, both positively and negatively. The most important of these factors are as follows:
Information Disclosure: Disclosure is the public dissemination of information voluntarily or according to administrative rules and regulations, even those that are usually kept confidential [17]. Disclosure is a basic principle of accounting that affects all aspects of financial reporting. The principle of disclosure requires that all important facts related to business events and financial activities be reported appropriately and comprehensively. Thus, basic financial statements should present all the important, relevant, and timely information as comprehensibly and comprehensively as possible to allow users to make informed decisions (International Accounting Standards Committee, 2014). According to accounting texts, disclosure can be dependent on the qualitative goals of accounting information, such as comprehensiveness, relevance, importance, reliability, and comparability. Regarding the nature of disclosure, there is disagreement as to it being a goal or a principle, an assumption or a promise. Arguably, disclosure is more than a principle and a means to accounting ends [7].
Audit Quality: Audit quality provides a degree of confidence that the auditor has obtained sufficient and appropriate evidence for the fair presentation of financial statements [28]. As a critical internal mechanism, internal audit play an effective role in the corporate governance process and can assure reporting quality. Internal auditors are a fundamental pillar in corporate governance and participate in both strategic and supervisory aspects of corporate governance. These two roles will ultimately improve financial reporting [8]. Audit quality is defined in relation to observance of auditing standards. However, audit quality has multiple aspects, such as discovering and reporting major errors in financial statements, the likelihood of refraining from issuing a conditional report for financial statements with important errors, the auditor's ability to reduce errors and biased distortions, and the accuracy of reported information. Audit quality significantly affects financial reporting quality, and examining audit quality at the initial public offering can be beneficial to evaluating company shares [28]. High audit quality enhances accounting information by reducing information asymmetry [20].
Management Ability: As an aspect of corporate human capital, management ability refers to managers' efficiency in converting company resources into income relative to competitors [24]. These corporate income generation sources include the price of inventories, administrative, distribution, and sales costs, fixed assets, operating rents, research and development costs, and the company's intangible assets. A higher management ability results in more efficient management of the company's routine operations. Its effect is especially significant in critical operating conditions, and it can have a significant impact on the company's performance through appropriate management decisions [18].
Internal Control System: Internal inspection and control means organizational control by internal entities, and the report is submitted to internal officials or stakeholders [9]. It is a process undertaken by the board of directors, management, and employees of a company to provide reasonable assurance on achieving the objectives, operational efficiency, reliability of financial reporting, and compliance with the relevant rules and regulations [33]. Owners, beneficiaries, and senior managers of enterprises are the two groups that use the internal control system. By establishing an internal control system, the decisions of organization managers will be in the interests of its owners and beneficiaries [23].
Corporate Governance: Corporate governance is a set of processes, customs, policies and procedures, laws, and factors that influence how a company is guided or supervised under separation of ownership and management. The main reasoning is that since the corporation is nothing more than a legal entity, its values must derive from the

preferences or values of its stakeholders. In other words, corporate values are created when stakeholder values become overriding, key, and internalized [14]. Corporate governance is the foundation of high-quality financial reporting. It is hard to imagine a good financial report from an organization with a bad governance structure. Therefore, progress in corporate governance directly helps enhance financial reporting to a higher level. In practice, corporate governance requires establishing high quality financial reporting. Therefore, it is very difficult, if not impossible, to predict a favorable financial reporting from an unfavorable corporate governance structure. Therefore, corporate governance directly seeks to improve financial reporting quality to a more favorable level. Good governance is important for providing management and the board of directors with an awareness of their responsibilities to act accountably towards all stakeholders and submit useful reports to them [43].

Information Asymmetry: In some situations, despite managers' awareness of future cash flows, investment opportunities, and their management skills, investors are uncertain about the company's prospects. This is called information asymmetry [28] and means a lack of information access to everyone. Based on their position, the management has more information than others. Therefore, information asymmetry is the main factor that guides managers towards profit management. They manage reported profit by focusing on various goals and motives, such as influencing the stock price, maximizing their favorability and welfare, and refraining from the violation of debt contracts [6]. The relationship between financial reporting quality and information asymmetry is related to the firm's information environment, and poor quality is costlier, especially for smaller firms. Greater information asymmetry is costlier since it increases the risk of incorrect selection for investors and reduces liquidity [22]. Due to information asymmetry, IPOs are not only obligated to publish their audited financial statements for the past several years, but their audited financial projections as well.

Audit Committee: It is an executive committee consisting of the company's specialized board members and is responsible for monitoring financial disclosure and reporting. Having an audit committee is the necessary but not sufficient condition for guaranteeing financial reporting quality in companies [36]. Various characteristics can be listed for the audit committee, such as composition (expertise and independence), size, gender, tenure, effort, experience, and more. In advanced countries, audit committees have become an important tool and a crucial factor in companies for monitoring the reliability of financial reporting. An effective audit committee makes audited annual financial statements more valid. Its members also cooperate with the board of directors, which is responsible for protecting shareholder interests, to help management fulfill its obligations in monitoring the quality and usefulness of financial statements, auditing, and the financial reporting process [36]. Like financial reporting quality, the audit committee has various characteristics and indicators, some of which have been proven to have a significant relationship. These include the significant relationship of financial expertise with the audit committee's experience and the timeliness of financial reports, as reported by [44].

Stock Exchange Rules and Regulations: The stock exchange is an organized and official capital market where company shares or bonds from the government or reputable private institutions are traded under certain rules and regulations. An important characteristic of the stock exchange is legal protection of the owners of savings accounts, liquid funds, and the legal requirements for capital applicants (Securities Market Act of the Islamic Republic of Iran, 2009). Creating strict information disclosure regulations for companies and establishing penalties for non-transparent information forces companies to disclose information and increase transparency. Therefore, stock exchange rules and regulations such as the mandatory disclosure of information asymmetry and conflict of interests reduces the agency between managers and external investors [6]. Based on investment protection policies and approaches, financial reporting quality is mainly defined in terms of full and fair disclosure to shareholders. Ever since Arthur Levitt, the former chairman of the United States Securities and Exchange Commission, raised the problem of earnings management and announced and implemented preventative plans, there has been growing attention on the stock market for guaranteeing financial reporting quality [7].

Conflict of Interest: The separation of corporate ownership from management could allow managers to make decisions in or against the interests of owners, especially minority shareholders, which produces a conflict of interest. Due to conflict of interest, beneficiaries bear agency costs for aligning the owners' interests with their own or mitigate its effects. The manager, who is at the center of the conflict of interest, tries to reduce agency costs by publishing the company's financial information [11]. Conflict of interest creates shareholder demand for independent audit services [28]. Sometimes, the interests are not directly toward managers, and companies trade with related parties to choose accounting methods that prevent the comparison of their accounting information with similar companies. Thus, they hide the adverse effects of such trades and reduce their detection by investors, governments, and other legal institutions [6]. Due to the conflict of interests between shareholders and managers, high-quality financial reports will greatly alleviate the concern of shareholders [35]. Accounting and auditing standards aim to produce clear and accurate information so that people with high economic influence and power are less susceptible to ethical failure and corruption [5].

3 Domestic Literature

In their study entitled "Explaining the Relationship of Audit Quality, Auditor Independence, and Audit Fees with Financial Reporting Quality in Insurance Companies," [16] stressed that increasing audit quality reduces illogical reporting decisions by management regarding profit quality to ultimately improve financial reporting quality of businesses. They used the correlation method and multivariate regression research. The statistical population covered all Iranian insurance companies from 2012-2018. The results suggested a significant and direct correlation between audit quality and financial reporting quality.

Namazi & Azizi [37] examined the companies listed on the Tehran Stock Exchange and Iran Fara Bourse to study the moderating effect of audit quality on the relationship between financial reporting quality and IPO underpricing. The statistical sample included 230 companies and covered 18 years from 2001-2018. In this study, audit quality included audit firm size, tenure, and auditor opinion and the results showed that on average, 25% of IPOs in the Iranian stock market are underpriced. In addition, financial reporting quality has a significant negative effect on IPO underpricing. In other words, high quality financial reporting prevents IPO underpricing. They also found that audit quality in terms of auditor opinion strengthens the correlation between financial reporting quality and IPO pricing, whereas audit firm size and auditor's tenure do not moderate this correlation. Generally, this study evaluated a network of relationships between the factors influencing financial reporting quality and the factors and variables it influences.

Nazari et al.'s [36] study aimed to investigate the relationship between audit committee and financial reporting quality, citing Article 10 of the Internal Control Guidelines of the Securities and Exchange Organization. They used a statistical sample of 175 companies listed on the Tehran Stock Exchange from 2017-2019. The panel method of multivariate regression analysis was used to test the hypotheses, estimation procedures, and the model's assumptions. The results suggest that the communication of the Internal Control Guidelines of Securities and Exchange Organization has improved audit committees and financial reporting quality as an indicator of the activities of these committees. Their findings also indicate that more qualified audit committees with financial expertise and independent members provide more effective supervision and enhance the financial reporting quality of their respective firms.

In a study entitled "Investigating the Effect of Audit Committee Chairman's Characteristics on the Relationship between Financial Reporting Delay and Value-Relevance," [45] stressed investors' negative reaction to financial reporting delay and the audit committee chairman's role in improving financial reporting quality and lower financial reporting delay. They concluded that reporting delay diminishes value-relevance. The head of the audit committee's specialty also has a positive effect on value-relevance; however, it does not affect the relationship between financial reporting delay and value-relevance.

In their study entitled "Evaluating the Effect of Audit Quality on Financial Reporting Quality in Initial Public Offerings," [28] cited agency problems due to manager-shareholder conflicts of interests. They named audits as an effective solution to limit management power in contractual relationships and obtained the data for the companies initially listed on the Tehran Stock Exchange between 2016-2018 and tested the hypotheses using the cross-sectional regression model. Their findings indicate that audit firm size changes financial reporting quality. Moreover, changes to audit quality also lead to changes in financial reporting quality. Based on their analysis, the change in the interactive effect between audit quality and the audit firm's ranking by the Iranian Association of Certified Public Accountants (IACPA) also changes the firm's financial reporting quality.

Amirazad et al.'s [6] study aimed to present a conceptual model of factors affecting financial reporting quality using the grounded theory and expert opinion on financial reporting quality from the four major groups, namely producers of accounting information, users of accounting information, auditors, and researchers. Through interviews, they first presented the conceptual model of financial reporting quality including causal, structural, and intervening factors, and financial reporting quality improvement strategies and their outcomes. After analyzing the data from filled questionnaires, they found that information asymmetry affects financial reporting quality. At the same time, according to this causal relationship and the other identified relationships, they presented strategies to improve financial reporting quality, such as establishing an effective internal control system and a suitable system for the end cost of products, using the extensible financial reporting language, interim financial reporting, and more. They were created based on contextual and intervening factors. According to this conceptual model, improving financial reporting quality has positive outcomes inside the company, in the capital market, and the overall economy.

In a study entitled "Investigating the Effect of Firm Characteristics on the Financial Reporting Quality of Firms Listed on the Tehran Stock Exchange," [1] used the systematic exclusion sampling method to investigate 120 companies on the Tehran Stock Exchange from 2003-2012. They investigated the effect of seven factors of firm characteristics as three structural (firm size and leverage), regulatory (composition of the board of directors and institutional shareholders) and performance (profitability, liquidity, and company growth) variables. The results showed that firm size, profitability, liquidity, and growth have a significant positive relationship, and leverage and the composition of the board of directors have a significant negative relationship with financial reporting quality. Also, the variable of institutional shareholders does not have a significant relationship with financial reporting quality.

4 Foreign Literature

In their study entitled "Corporate Governance, Internal Audit Quality, and Financial Reporting Quality," [29] investigated the relationship between corporate governance characteristics (board expertise, board independence, and board performance), internal audit quality, and financial reporting quality using evidence from Ugandan companies. Their findings show that the expertise and performance of the board of directors have a significant relationship with financial reporting quality. Moreover, internal audit quality has a significant relationship with financial reporting quality and the board's independence is not a predictor of financial reporting quality.

Bawono et al.'s [10] analysis of the effective factors of financial reporting quality in the Sulawesi Province of Indonesia used a quantitative research method and regression-based approaches. They concluded that the internal control system positively affects the government's financial reporting quality in the central province of Sulawesi.

Setiyawati et al.'s [46] study entitled "Factors Affecting Financial Reporting Quality" in Indonesia aimed to determine the effect of the principles of good corporate governance, observing regulations, and applying internal control systems on financial reporting quality. They concluded that implementing the principles of good corporate governance, observing regulations, and implementing internal control systems have a significant positive effect on financial reporting quality.

Olanisebe et al. [39] investigated the effect of independent auditors on financial reporting quality with a statistical population of banks listed on the Nigerian Stock Exchange. The study covers the 5-year period from 2012-2016. The hypotheses were tested using the multiple regression technique, and the researchers showed a significant positive relationship between audit fees and financial reporting quality.

Evana & Dewi's study [19] of the factors affecting financial reporting reliability also concluded that the audit committee has significant positive results on financial reporting reliability.

5 Research Methodology

The is a descriptive-analytical study in terms of purpose. Since this study is an effort to understand a specific situation in the real world and use the results to provide solutions for development and improvement, this study is applied.

This descriptive field research is conducted using the opinions of experts. At the same time, it is considered analytical for trying to obtain the significance and priority of said variables based on the personal experiences and observations so far. Although the researcher does not have a role in the relationship between different factors, it is considered post-hoc since no specific event is being considered. All auditing experience and financial reporting is observed and judged by experts. With regards to time, this is a cross-sectional study that cites the experiences and opinions of experts up to a specific period of time. And in terms of data type, this study is qualitative.

Based on a library study of the factors affecting financial reporting quality, such as information disclosure, management ability, corporate governance, audit committee, audit quality, information asymmetry, internal control system, stock exchange rules and regulations, and conflict of interest, this study first determined cause-and-effect and network relationships between said factors and determined financial reporting quality. Then, the weight of each variable was calculated using the fuzzy analytic hierarchy process.

Since it is essential to collect specialized and accurate data about the research topic and no other probability sampling designs can do so, the non-probability and purposive judgment sampling method was used for selecting managers and experts. To determine the weights and relevant criteria of each dimension, the fuzzy analytic hierarchy process was used. The opinions of ten available experts were used to determine the weights of the variables in cause-and-effect relationships. Data analysis was modeled and executed in Microsoft Excel. Figure 1 shows the research model.

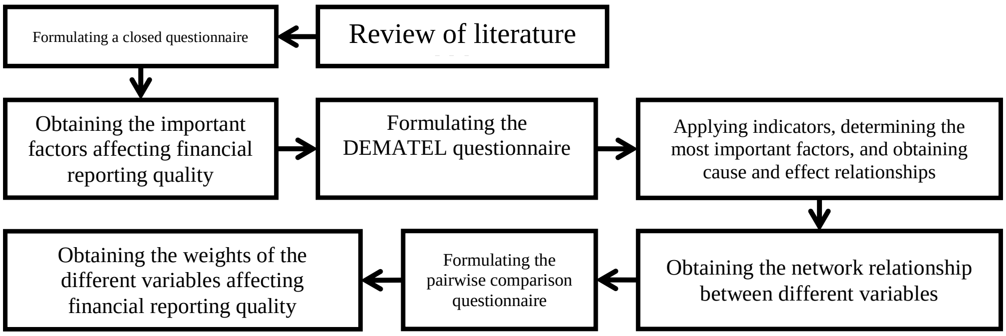

Figure 1: The Model Used for Deriving the Weights of Financial Reporting Quality Factors

6 DEMATEL Approach

The DEMATEL (Decision Making Trial And Evaluation) approach can identify the pattern of causal relationships between a set of criteria. This method examines the intensity of relationships via scores and evaluates feedbacks and their importance [2] and was proposed by Fonetla and Gabus in 1971.

7 Fuzzy Analytic Network Hierarchy Process

The analytic network process is a new theory that expanded the analytic hierarchy process to explore the dependence relationships in feedback. Therefore, the supermatrix approach was used. This approach was planned by Thomas L. Saati to solve problems involving dependence between criteria or options [34]. The three main stages of the analytic network process include planning the model and problem structure, forming the pairwise comparisons matrix and priority vectors, and presenting the supermatrix [12]. Table 1 lists the fuzzy numbers used in pairwise comparisons.

Table 1: Preferences and Their Corresponding Fuzzy Number in Pairwise Comparison of Criteria and Subcriteria

Code	Preferences	Fuzzy Equivalent of Preferences		
		Lower Limit (l)	Medium Limit (M)	Upper Limit (U)
1	Same importance	1	1	1
2	Same to slightly more important	1	2	3
3	Slightly more important	2	3	4
4	Slightly more important to more important	3	4	5
5	More important	4	5	6
6	More important to high priority	5	6	7
7	High priority	6	7	8
8	High priority to fully prioritized	7	8	9
9	Fully prioritized	8	9	10

The geometric means corresponding to the low, medium, and high limit numbers were used to calculate the average numbers assigned to pairwise comparisons. Here, K is the number of participants in the pairwise comparison.

$$M_{ij} = \left(\sqrt[k]{l_1 \times 1_2 \times \cdots \times l_k}, \sqrt[k]{m_1 \times m_2 \times \cdots \times m_k}, \sqrt[k]{u_1 \times u_2 \times \cdots \times u_k} \right)$$

Chang's developmental model [15] was used for weight calculations. First, Si values are obtained for each row of the fuzzy pairwise comparison matrix based on the following equation.

In this equation, M $S_i = \sum_{j=1}^{m} M_{gi}^{j} \otimes \left[\sum_{i=1}^{n} \sum_{j=1}^{m} M_{gi}^{j} \right]^{-1}$ represents the triangular fuzzy numbers in the pairwise comparisons matrix. In fact, when calculating the S matrix, each component of fuzzy numbers is added like for like and multiplied by the fuzzy inverse of the grand total. This stage is similar to the calculation of normalized weights in the ordinary analytic hierarchy process method, except with fuzzy numbers. In the following, the Si values are compared in terms of magnitude using the following equation:

$$V(M_2 \geq M_1) = hgt(M_1 \cap M_2) = \mu_{M_2}(d) = \begin{cases} 1 & \text{if } m_2 \geq m_1 \\ 0 & \text{if } l_1 \geq u_2 \\ \dfrac{l_1 - u_2}{(m_2 - u_2) - (m_1 - l_1)} & \text{otherwise} \end{cases}$$

$$M_2 = (l_2, m_2, u_2), \quad M_1 = (l_1, m_1, u_1)$$

To calculate criteria and option weights in the pairwise comparison matrix, the non-normalized weight vector is obtained by calculating the lowest V value from the previous step. Finally, the weight vector obtained from the previous stage is normalized to obtain the final weight vector, which is the ultimate goal of fuzzy calculations. The final weights of each of the main variables and their sub-variables are calculated using the matrices obtained through the normal analytic hierarchy process and the analytic network process. The final matrix of hierarchical relationships, also known as the big matrix, was fixed after being taken to the power of the odd numbers. The weights of the matrix were the final weights of each variable.

8 Findings

8.1 Obtaining the Cause and Effect Relationship between Variables and Financial Reporting Quality

After identifying the 8 variables affecting financial reporting quality, their cause and effect relationship was determined using the DEMATEL approach and the opinions of 10 experts, resulting in a questionnaire. The average of opinions related to the effect between variables was calculated and the final cause and effect relationship between them was determined. Assuming the threshold value of 0.11 somewhat reduced the set of causal relationships, Table 2 shows the final state of the relationship between the variables after applying the threshold value.

Table 2: Preferences and Their Corresponding Fuzzy Number in Pairwise Comparison of Criteria and Subcriteria

Factor	Information disclosure	Corporate governance	Audit quality	Internal control system	Financial reporting quality
Information disclosure	0	0	0	0	0.13
Management ability	0.13	0.12	0.12	0.12	0.14
Corporate governance	0.12	0	0.12	0	0.13
Audit committee	0.12	0	0	0	0.13
Audit quality	0	0	0	0	0.13
Information asymmetry	0	0	0	0	0.13
Internal control system	0.12	0	0.12	0	0.13
Stock exchange rules and regulations	0.12	0	0	0	0.13
Conflict of interest	0.13	0.12	0.12	0.12	0.13

As shown in Table 2, all nine variables affect financial reporting quality. However, information disclosure, corporate governance, audit quality, and internal control system are themselves affected by other variables.

8.2 Obtaining the Weights of Variables

A pairwise comparison matrix was used to obtain the weights of variables. Table 3 shows the general demographic information of questionnaire respondents. The main big matrix is shown as Table 4.

Since management ability, audit committee, stock exchange rules and regulations, and conflict of interest have acted independently, their relationship with financial reporting quality is considered through information disclosure, corporate governance, audit quality, and internal control system. Therefore, their weight is considered zero under

Table 3: Information of Respondents to the Pairwise Comparison Questionnaires

No.	Age	Gender	Degree	Workplace	Organizational position	Work experience
1	39	Male	MA	University	Faculty member	12
2	58	Male	Ph.D.	University	Faculty member	29
3	41	Female	Ph.D.	Stock exchange	Employee	17
4	40	Male	Ph.D.	University	Faculty member	16
5	39	Female	MA	University	Faculty member	16
6	42	Female	MA	University	Adjunct professor	5
7	45	Male	Ph.D.	University	Faculty member	18
8	35	Female	MA	University	Adjunct professor	5
9	45	Male	Ph.D.	Institution	Auditor	22
10	44	Male	Ph.D.	Blood transfusion	Auditor	18

Table 4: The Big Matrix of the Pairwise Comparison of the Variables Affecting Reporting Quality

Conflict of interest	Stock exchange rules and regulations	Audit committee	Management ability	Information asymmetry	Internal control system	Information asymmetry	Information disclosure	Audit quality	Financial reporting quality	Factor
0	0	0	0	0	0	0	0	0	0	Financial reporting quality
0	0	0	0	0	0	0	0	W3	W1	Audit quality
0	0	0	0	0	0	0	W2	W3	W1	Information disclosure
0	0	0	0	0	0	W4	W2	W3	W1	Corporate governance
0	0	0	0	0	W5	0	W2	W3	W1	Internal control system
0	0	0	0	1	0	0	0	0	W1	Information asymmetry
0	0	0	1	0	W5	W4	W2	W3	0	Management ability
0	0	1	0	0	0	0	W2	0	0	Audit committee
0	1	0	0	0	0	0	W2	0	0	Stock exchange rules and regulations
1	0	0	0	0	W5	W4	W2	W3	0	Conflict of interest

financial reporting quality. At the same time, information asymmetry has independently and directly affected financial reporting quality without the influence of other variables.

For financial reporting quality and each of the main variables, the mean pairwise comparison matrix was obtained and the weight of its items were calculated. Table 5 shows the average of pairwise comparisons related to financial reporting quality. After normalizing the rows and columns in Table 6 and obtaining the crisp numbers of pairwise comparisons using Chang's approach in Table 7, the relevant weights were obtained.

The big Table 8 was obtained after calculating the other main and secondary variables.

Table 9 was obtained by taking the big matrix to power of 41, which reached saturation at the final ten decimals.

As shown, management ability, audit committee, and conflict of interest are the final variables affecting financial reporting quality with respective weights of 0.9, 0.06, and 0.04.

Table 5: Average of the Pairwise Comparisons of Variables Directly Related to Financial Reporting Quality

	Audit quality			Information disclosure			Corporate governance			Internal control system			Information asymmetry		
	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Audit quality	1.00	1.00	1.00	1.46	1.69	1.97	0.41	0.46	0.51	1.20	1.34	1.49	2.95	3.50	4.04
Information disclosure	0.51	0.59	0.69	1.00	1.00	1.00	1.53	1.79	2.08	0.38	0.47	0.57	1.87	2.29	2.73
Corporate governance	1.94	2.20	2.42	0.48	0.56	0.65	1.00	1.00	1.00	2.39	2.90	3.44	1.62	1.85	2.12
Internal control system	0.67	0.74	0.84	1.74	2.14	2.61	0.29	0.34	0.42	1.00	1.00	1.00	1.17	1.31	1.45
Information asymmetry	0.25	0.29	0.34	0.46	0.44	0.54	0.47	0.54	0.62	0.69	0.76	0.85	1.00	1.00	1.00

Table 6: Sum of the Lines of the Pairwise Comparison Matrix of Financial Reporting Quality

	Total of Line			Multiplied in the inverse of column total		
	Low	Moderate	High	Low	Moderate	High
Audit quality	7.01	7.99	9.02	0.27	0.34	0.44
Information disclosure	5.29	6.14	7.07	0.20	0.26	0.35
Corporate governance	7.44	8.51	9.63	0.28	0.37	0.47
Internal control system	4.87	5.54	6.31	0.18	0.24	0.31
Information asymmetry	2.88	3.02	3.35	0.11	0.13	0.16
Column total	20.48	23.22	26.35			
Inverse of column total	0.04	0.04	0.05			

Table 7: Comparing the Crisp Numbers of Pairwise Comparison of Financial Reporting Quality and Obtaining the Final Weights

	Audit quality	Information disclosure	Corporate governance	Internal control system	Information asymmetry	Lowest value	Normalization
Audit quality	1.00	1.00	0.87	1.00	1.00	0.87	0.36
Information disclosure	0.50	1.00	0.38	0.50	1.00	0.38	0.16
Corporate governance	1.00	1.00	1.00	1.00	1.00	1.00	0.41
Internal control system	0.28	0.81	0.17	1.00	1.00	0.17	0.07
Information asymmetry	0.00	0.00	0.00	0.00	1.00	0.00	0.00

9 Conclusion and Recommendation

This study evaluated the effect of various variables on financial reporting quality. However, remember that financial reporting quality has different dimensions with different effects.

Management ability emerged as the primary and the most effective variable in reporting quality due to its effect on the other variables affecting financial reporting quality. It has transferred its effect via a network of relationships and influences. Management ability is a variable that appears in a company's current process and routine operations, including financial issues and audit. Based on this analysis, the weighted importance of management ability in audit quality, information disclosure, corporate governance, and internal control system is also very significant and dominant in nearly all cases. This is possibly due to the specific conditions of Iranian enterprises and the experiences and observations of participating experts, who assessed the role of management ability to be so considerable.

According to Mousavi Shiri et al.'s study [32] the audit committee affects financial reporting quality through

Table 8: The Big Matrix of Pairwise Comparison of the Variables Affecting Reporting Quality

Conflict of interest	Audit committee	Management ability	Internal control system	Corporate governance	Information disclosure	Audit quality	Financial reporting quality	Factor
0	0	0	0	0	0	0	0	Financial reporting quality
0	0	0	0	0	0	0.49	0.36	Audit quality
0	0	0	0	0	0.56	0	0.16	Information disclosure
0	0	0	0	0.56	0	0.5	0.41	Corporate governance
0	0	0	0.38	0	0	0.01	0.07	Internal control system
0	0	1	0.3	0.44	0.27	0	0	Management ability
0	1	0	0	0	0.17	0	0	Audit committee
1	0	0	0.32	0	0	0	0	Conflict of interest

Table 9: The Saturated Big Matrix of the Variables Affecting Reporting Quality

Conflict of interest	Audit committee	Management ability	Internal control system	Corporate governance	Information disclosure	Audit quality	Financial reporting quality	Factor
0	0	0	0	0	0	0	0	Financial reporting quality
0	0	0	0	0	0	0	0	Audit quality
0	0	0	0	0	0	0	0	Information disclosure
0	0	0	0	0	0	0	0	Corporate governance
0	0	0	0	0	0	0	0	Internal control system
0	0	1	0.48	1	0.61	0.99	0.9	Management ability
0	1	0	0	0	0.39	0	0.06	Audit committee
1	0	0	0.52	0	0	0.01	0.04	Conflict of interest

proper monitoring, and its effectiveness in this case confirms its moderating role. It is noteworthy that the audit committee also has multi-dimensional characteristics that, as stated in Nazari et al.'s study [36], can separately and specifically affect financial reporting quality. For example, Salehi et al. [45] confirmed the effect of the chief of the audit committee's characteristics on reducing financial reporting delay. However, there are other characteristics such as the skills or independence of committee members and their age and gender, which can each affect financial reporting quality or its dimensions, which are not necessarily equal or balanced. According to the experts surveyed in this research, in addition to financial reporting quality, the audit committee also has a major role in information disclosure.

This study suggests that the variable of conflict of interest also affects financial reporting quality. Although experts believe that conflict of interest does not have a very high impact, it has a significant weight in the internal control system. Remember that conflict of interest is an inherent and gradual phenomenon between firm managers and shareholders, and such a phenomenon can be mentioned as a pressure lever to improve reporting quality through applying the necessary trust-building controls. This is consistent with Kalbasi & Khosravipour's perspective (2020) regarding the necessity of independent auditing.

This study sought the opinions of experts in auditing and writing financial reports to identify the most important factors on financial reporting quality. The interaction between these variables with each other and with financial reporting quality was investigated, which surprisingly showed that contextual variables outside of everyday initiatives represented themselves as important and key variables. To guarantee the favorability of these variables requires adopting basic and stable policies and strategies in companies.

This study did not cover the components and features related to each concept, including financial reporting quality and its relationship with other variables or the features related to those variables. Therefore, it is recommended to identify such a relationship structure by applying the available quantitative data or citing the experiences and evidence of experts in the framework of cause-effect relationships and the relevant approaches.

This study also showed the role of contextual variables in the other mechanisms improving financial reporting quality. In terms of implementing those approaches, assurance of the favorability of basic variables can be explored. However, guaranteeing favorable conditions for all mentioned variables can be followed based on company characteristics and the most important feasible strategies. The necessary evaluations should precede the selection of the best strategies and operational solutions.

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