

# An efficient model for ranking and evaluating the independence of auditing firms with a fuzzy Delphi approach

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*(Communicated by Farshid Khojasteh)*

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## Abstract

Since independence is the most important characteristic of an auditor, we want to expand and develop this characteristic in auditing institutions, so our goal is to provide a practical and practical solution to maintain independence in auditing institutions. We collected and summarized. The experts stated that out of 34 characteristics of auditor independence, except 8 cases are applicable in audit institutions. If these features are not collected in one place and are dispersed and individually under the title of auditor independence, we will rarely see the independence of audit institutions. Currently, the only place where the characteristics of independence can be summarized and considered under a practical and operational model is in the ranking of audit institutions, which is done by the public accountants community. If these characteristics and criteria are taken into account and used in a practical way in the ranking of auditing institutions, we can increase and maintain the independence of auditing institutions. The ranking of auditing institutions can be more appropriate by considering the independence characteristics and bringing fair distribution of work.

Keywords: independence of auditing institutions, ranking of auditing institutions, selection of auditing institutions  
2020 MSC: 03B52, 90C70

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## 1 Introduction

The auditor's independence is defined as the ability to resist the pressure and influence of the management [13]. If the auditor is not independent of the employer, his opinion will not add anything to the credibility of the financial statements, and without independence, the audit is meaningless. In fact, the importance of the auditor's independence is to the extent that it affects all other characteristics [8]. The auditor's independence in the previous texts was divided into two categories, external and internal, and the external independence of the auditor means determining the physical location of the employer and management, and the examples of external independence were considered to be the close relationship with the employer and the remuneration received from the employer, and the internal or mental independence is that which The auditor was honest and acted independently from the employer and his pressures during the audit [9].

But the auditor's independence has progressed in recent years to the point where the old classification is no longer used as a criterion, and they do not consider it a state of mind and the meaning of impartiality, but they consider it to

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mean the destruction of material interests, and the auditor cannot express his true opinion under the influence of these factors. That is, in the new perspective, a movement has begun from the mental and judgmental personality of the auditor to the commercial personality of the auditor [20]. Independence is like an umbrella that casts a shadow on the other characteristics of the auditor such as quality, honesty, integrity, etc., and it includes a large set of factors that other factors are a subset of it, and it is a function that other characteristics are variable. Most of the auditors are working in the form of audit institutions, so currently, our society is facing the issue of independence of audit institutions, while more research has been done on the independence of the auditor. How can the independent characteristics of an auditor be developed and extended to a group of auditors who operate under the title of an auditing firm? If each individual has independence and maintains it, is the whole group independent, or is it possible for individual independence to fade due to the interests of the collective of individuals? What will happen if one person is independent and the other partner acts non-independently? Therefore, the independence of an institution will be maintained only if more partners are independent and neutralize the effect of non-independent partners with their majority. How can we extend the features of auditor independence to audit institutions and maintain the independence of audit institutions? What are the strategies for maintaining the independence of audit institutions? Are the same strategies for maintaining independence that have been listed by various scholars to maintain the independence of auditors for the independence of an institution? Is the audit also enough? Is the independence of the audit institutions respected and do the audit institutions act independently? We scrutinize and analyze one of the examples of independence of the auditor, which is a solution to maintain independence, and by removing the weak points of this solution, we intend to develop and spread it to auditing institutions.

As a suggested solution for the auditor's independence, Dr. Hassah Yeganeh says that the judgment (audit opinion) should be taken from the auditor himself and given to audit judicial courts composed of professional accountants so that they can judge (audit opinion). In other words, the auditor should collect the necessary evidence for the court and the responsibility of judgment and opinion of the audit should be entrusted to the judicial audit court (regarding the audit of financial statements) [9]. Currently there is no such judicial audit court and the above solution is for individual auditors and the creation of a court Judicial audit for this type of auditors is not very useful for statesmen, professional societies, associations, organizations, etc. But if this solution is considered in audit institutions where several audit partners are working in that institution, it may seem like a good idea. He entrusted the auditor's fee to this organization so that the right to choose and pay the fee is taken away from the employer. From this path, the independence of auditing institutions will increase and the chain of financial relations and the influence of the employer on the auditing institutions will be broken. The auditing institutions also have various concerns, Satisfying customers, bargaining with customers and keeping them will not be possible through acceptable comments and conditional fees.

However, one of the requirements of this independent institution is how to distribute the work among the audit institutions, so that we do not have the problem of non-compliance with the independence in another way, and the independence of the institutions is put in the best possible condition, the problem of independence from another angle and point of view still persists. Is the current ranking criterion, which does not consider the criteria of independence, free from mistakes? Can it be relied on for the fair and just distribution of work? If the criterion of this independent body for the distribution of work is the same as the current ranking, then the problem of lack of independence will be solved. We have not been able to solve it fundamentally. As in a research conducted by Madras in 2012 to investigate effective safeguards for auditor independence, they found that the factors affecting independence in the current state of the auditing profession in Iran are not properly used [16].

One of the strong evidences regarding the weakness and not seeing the issue of auditor independence in the evaluation of the Iranian Stock Exchange Organization and the classification of the Certified Public Accountants Society of Iran can be seen in the rating checklists of these two institutions, and these checklists will be the criteria for the superiority of one institution over another. In the audit work quality control questionnaire, out of 1000 relevant points (which the institutions must obtain and according to their points, be placed in one of the ranks of *A*, *B*, *C*, and *D*), only 10 points are allocated to the independence of the auditor, i.e. 1 percent. We will analyze this 1 percent for further investigation. The same 1 percent includes 5 points related to the evidence and documents reviewed in accepting the continued work, 3 points related to the correspondence with the previous auditor and checking the received answer and complying with the society's rules, 2 points related to the completion of the independence form of partners and employees. The question that arises here is: despite the many criteria that researchers and experts have announced in the field of auditor independence (more than 10 criteria such as competition, reputation, transparency, specialization, efficiency, laws and financial issues, etc.), is it appropriate that the subject Is independence in the rating of institutions only 1% of the total points?

And is it true that the auditor's independence criterion (the big umbrella of all the auditor's characteristics) is only the completion of an independence compliance form by the partners and employees of the auditing firm?

## Importance, necessity and innovation

With regard to the classification of internal and external research based on the research method and research topic, it can be seen that researches have been conducted in the field of auditor independence and various aspects and angles have been addressed to the problem of auditor independence (independence effect, independence relationship, independence review, independence obstacles). but they have not been able to produce practical knowledge and they lack providing a practical model for the independence of auditing and rating institutions, so the research gap and knowledge gap in this field is evident. One of the innovations of this research and its difference from other researches is that it has provided a model to solve the problem of selection and independence of audit institutions, and no research was observed in relation to the presentation of the model of the selection of audit institutions considering independence criteria. Presenting a practical model in the field of selecting audit institutions with emphasis on independence criteria is the main difference of this research with other researches.

Another innovation of this research is that it has expanded the independence from the level of auditor independence to the independence of audit institutions. Countless researchers have mentioned the issue of auditor independence, but the issue of independence of audit institutions has not been researched. This fundamental and important difference with other researches and researches, for the independence of audit institutions and not the independence of the auditor, can be a good start for other researchers and new researches in the field of providing more models and expanding and developing the concept of auditor independence to the concept of independence of audit institutions.

## 2 Theoretical foundations and research background

### 2.1 Audit quality

Darabi et al. state that the quality and credibility of the audit report depends on the degree of independence of the auditor from his employer [5]. In any way, the auditor should indirectly capture the opinions of the employer in the audit report, his actions and expectations, and the quality audit report will be converted and modified into a report based on the employer's expectations. Bakhtiari et al. [4] concluded with their research that auditors try to make their judgments in accordance with their relationships with their owners in order to maintain and maintain relationships with their owners. This issue indicates that communication and social links can have a negative effect on the independence and quality of the audit.

### 2.2 Audit fees and receipts

As we know, maintaining the business owner and client in the competitive market of auditing firms is an important and vital thing because the continuation of this source of income will cause the growth and development of auditing firms in the coming years. It becomes more necessary to continue the cooperation of an audit firm, especially for auditors who have little capital or who have just entered the audit work environment. Soroush Yar et al. [22] concluded that the increase in competition in the audit market reduces the auditor's independence. As long as the employer has the right to choose the auditor, the employer considers the auditor to be under his control and influence, and due to the dependence of the auditor's fee on the employer, the independence of the auditor is overshadowed. will be placed The research of Mautz and Sharaf [15] also shows that when auditors generate a large part of their income from a client, there is an economic incentive to retain clients and economic rents increase.

### 2.3 Ranking of audit institutions

In accordance with the provisions of Article 31 of the Charter of the Association of Chartered Accountants of Iran, audit institutions have been divided into 4 groups *A*, *B*, *C* and *D* based on the quality control report. On February 28, 2011, the Stock Exchange Organization approved the rating guidelines for trusted audit institutions of the stock exchange. The criteria for classifying audit institutions include normal criteria (evaluation criteria for partners, employees, capital structure, etc.) and criteria for violations that are considered negative points and according to the points obtained, they are placed in four categories: first, third and fourth [15]. It is true that this grouping and classification was not a proof of their high quality and independence, but what is true is that the same basis is considered for the selection of the auditing firm for the owners, and it seems that they use this division for the selection of the auditor (except for cases where the law has required) are considered. Mautz et al. conducted a research on the relationship between the rating of the trusted audit institutions of the stock exchange organization and the quality of the audit and concluded that the quality of the audit of the private institutions trusted by the Stock Exchange

Organization of the first tier is not higher than the quality of the audit of the trusted institutions of the other tiers. The first floor, due to the size and our data, was not high on the quality of their audit or independence [15].

Mohammad Rezaei [17] studied auditor independence: a comparative analysis of the attitude of Iranian auditors and financial managers. They concluded that despite the existence of a general agreement on the indicators affecting the auditor's independence between the two groups of auditors and financial managers, there is a significant difference between the intensity and the extent of the influence of the investigated indicators on the auditor's independence between the two groups. Due to the fact that financial managers are the auditor's colleagues, the perceptions of these two groups may be different from the audit profession and audit report, and this is an important issue in the audit field, which causes the quality of the audit to be severely impaired. Tahriri et al. [23] examined the effect of threats on the independence of auditors and concluded that it indicates the negative effect of five important factors of threats on the external and internal independence of auditors and the expertise and experience of auditors affect the relationship between threats and internal independence and on the relationship There is no effect between threats and apparent independence. Saidi et al. [19] investigated the effect of individual characteristics on the disclosure tendencies of independent auditors. They concluded that independent auditors' view of internal disclosure is preferable to external disclosure. Also, individual characteristics are effective on the disclosure tendencies of independent auditors. Bakhtiari et al. [4] conducted a research on the supervisory relationship and the auditor's independence: a test of the theory of social bonds. They concluded that the higher the tendency of the auditors to have a supervisory relationship, the more likely the auditors will compromise their independence even with professional supervision. step, the relationship culture is considered as an influential factor in the relationship between the auditor and the employer in the auditing market of the country. In order to maintain relationships with their clients, auditors try to make their judgments consistent with their relationships with their clients. This issue indicates that communication and social links can have a negative effect on the independence and quality of the audit. Hatmian [10] investigated the effect of the auditor's tenure and independence on the number of paragraphs in the auditor's report and concluded that the tenure of the auditor has an inverse and significant effect on the number of paragraphs in the audit report, and the independence of the auditor has a direct and significant effect on the number of paragraphs in the audit report. Bakhtiari et al. [3] social capital and independence of auditors; examined the approach of professionalism, they concluded that social capital has a positive effect on the auditor's independence. This issue will promote and improve positive moral values. Darabi et al [5] studied the explanation of the relationship between audit quality, auditor independence, audit fees, and financial reporting quality in insurance companies and concluded that this relationship indicates the existence of a significant and direct relationship between audit quality, the independence of the auditor and the audit fee with the quality of financial reporting in insurance companies in Iran.

Desoky & Khasharmeh investigated whether providing non-audit services affects auditor independence and audit quality during a research [6] in Bahrain. They claim that respondents support the idea that auditor independence is impaired by providing non-audit services. Kang et al. in an article [12] studied non-audit services and auditor independence dependent on client performance and concluded that earnings management motivation Audit clients (based on their performance) alter the effect of simultaneous provision of audit services and non-audit services on auditor independence. In an article [11], Jenkins studied independence assessment as an essential element of the auditing profession in the United States. They argue that the auditor should use the increased resources and authority of audit committees under the Sarbanes-Oxley Act to allow the audit committee more responsibility and flexibility to manage auditor independence. Second, further disclosure of threats and protections to auditor independence may be instructive. Jenkins et al. [11] investigated the implementation of the good corporate governance model and auditor independence in improving the quality of earnings and found that by placing auditor independence in the corporate governance model, the effect of independent variables on income quality becomes larger, but auditor independence is influenced by the structure of the board of directors. , does not moderate the performance of internal audit and internal control activity on the quality of profit. Aniati et al. [2] studied non-audit fees and auditor independence in Nigeria. They found that auditors are allowed to provide non-audit services and auditor competition for appointment may drive audit fees below the market price required for an effective independent audit. Reduce; Therefore, non-audit services compromise independence. Onulaka et al. [18] studied the strengthening of independence of auditors in auditing companies in Vietnam. The results of their research show that the observed factors related to the working environment of the independent auditor affect the independence of the auditor. Marx & Harber, in a study entitled Auditor independence and professional skepticism in South Africa, concluded that the respondents do not believe that auditor independence and professional skepticism have been damaged, and that existing regulations and codes of practice need They do not need to be modified, and the auditor's independence and professional skepticism, as well as the longer tenure of the auditing firm, do not harm the independence and professional skepticism [14]. Doan et al. studied the effect of non-audit services on auditor independence and concluded that two factors directly affect auditor independence, tax services and management consulting services [7]. Aqel [1] researched the understanding of

loan disbursements and auditors of the factors affecting auditor independence: evidence from Palestine and found that the results indicate a significant difference in the understanding of independent auditors and loan disbursements in most of the statements related to the provision of non-audit services [7].

### 3 Research Methodology

#### 3.1 Type of research, statistical population, sample size and sampling method

This research is descriptive in terms of its purpose, applied in terms of research results, and in terms of the logic of inductive reasoning, and the process of its implementation is qualitative and quantitative (qualitative: in-depth interviews with experts and quantitative: distribution of questionnaires during one stage with statistical samples, the method of which is in the round method data collection is explained).

The statistical population of this research is made up of auditors who are members of the Society of Official Accountants of Iran, provided that they are partners of the auditing firm, which at the time of the research are 1124 people. Agasser Vedupnik states in 1991 that this group is more familiar with the concept of independence [20].

According to Cochran's formula, we calculate the sample size for a certain population and consider the level of confidence equal to 0.95 (in other words, we tolerate 5% error), the statistical population is equal to 1124 people. Therefore, the optimal sample size is equal to 286 people. will be. Considering that 197 people answered the questionnaires, the return rate of the questionnaires is 68%, which is an acceptable rate. In this research, we use the random sampling method. Thus, in the Excel software, a number was assigned to each audit institution in a separate table, for example, "A audit institution, number one, audit institution B, number two, audit institution C, number 3 and so on, then using the RandBetween function In the Excel software, we generated random numbers in another and separate table. We matched the randomly generated numbers with the number of the auditing firm that was determined in advance, in a separate table, and extracted the name of the firm. Questionnaires for Audit firm partners who were randomly selected were sent.

#### 3.2 Data collection method

We use the following steps to collect data:

- 1- The auditor's independence criteria are extracted from researchers' articles and books.
- 2- The auditor's independence criteria are extracted from experts (14 people) through interviews. It is obvious that at this stage, the interviews will continue until the new criteria are expressed by the experts. ends.
- 3- The auditor's independence criteria are extracted from the current standards (status quo).
- 4- After the criteria are extracted from the above three groups, repetitive and non-measurable criteria are removed in all three groups and the non-repetitive criteria are considered as the final criteria. is given, these criteria are determined by the fuzzy Delphi screening method, the weight and importance of each criterion.
- 5- After determining the weight and importance of each criterion, these criteria are considered in the new ranking and checklist of the independence assessment of the public accountants community as a ranking model for institutions with an emphasis on independence, and through a questionnaire, research samples (286 people) are available. Placed.

### 4 Fuzzy Delphi method

#### 4.1 Fuzzy Numbers

Let  $R$  and  $I$  stand for the set of all real numbers and the closed real interval  $[0, 1]$ , respectively. A fuzzy set on  $R$  is an arbitrary function  $A : R \rightarrow I$  (no additional assumptions are supposed on a fuzzy set). However, although a fuzzy number is a fuzzy set, there is no unique definition associated with the notion of fuzzy numbers because distinct properties can be considered. As a consequence, several notions about the idea of fuzzy numbers can be found in the literature (see, for instance, [11, 2, 18]). For our purposes, we will employ the following one.

A fuzzy number  $A$  (for short, a  $FN$ ) of the real line  $R$  is a fuzzy set of the real line,  $A : R \rightarrow I$ , satisfying: (1) normality ( $A(x_0) = 1$  for some  $x_0 \in R$ ), (2) fuzzy convexity ( $A\lambda x + 1 - y \geq \min\{A(x), A(y)\}$  for  $x, y \in R$  and

$\lambda \in [0, 1)$ , and (3) upper semicontinuity (if  $x_0 \in R$  and  $\varepsilon > 0$ , there is  $\delta > 0$  such that  $A(x) - A(x_0) < \varepsilon$  whenever  $x - x_0 < \delta$ ). Some researchers replace the normality condition with the existence of an absolute maximum. Function  $A$  is usually referred to as the membership function of the  $FN$ . Each real number  $A(x) \in [0, 1]$  can be interpreted as the uncertain degree that the point  $x$  belongs to the  $FN$   $A$ .

For each  $\alpha \in (0, 1]$ , the  $\alpha$ -level set (or  $\alpha$ -cut) of the  $FN$   $A$  is the crisp set  $A_\alpha = \{x \in R : A(x) > \alpha\}$ , and the kernel (or core) of  $A$  is  $ker A = A_1$ . Each level set is a (bounded or unbounded) closed interval of the real line (involving the Euclidean topology). In general, when  $A$  is an  $FN$ , the set  $\{x \in R : A(x) > 0\}$  can be closed, open, or none of them. To maintain the closedness of the level sets, we define the support of an  $FN$   $A$  as the set  $supp(A) = cl(\{x \in R : A(x) > 0\})$ , where  $cl(\Omega)$  denotes the closure of a subset  $R$  in the Euclidean topology. In such a case, its support is also a closed interval. Notice that  $A_\alpha \subseteq A_\beta \subseteq supp(A)$  for all  $\alpha, \beta \in (0, 1]$  such that  $\beta \leq \alpha$ .

Each level set and the support of an  $FN$  can be bounded or unbounded in  $R$ . For our purposes, we will only consider  $FN$ s whose supports are bounded in  $R$ . Coherently, we will denote by  $F$  the set of all  $FN$ s of the real line with bounded support. In such a case, if we use the convention  $A_0 = supp A$ , then each level set is a non-empty, closed, and bounded real interval, so it can be denoted by  $A_\alpha = [\underline{a}_\alpha, \overline{a}_\alpha]$  for each  $\alpha \in I$ , where  $\underline{a}_\alpha$  and  $\overline{a}_\alpha$  are, respectively, the inferior and superior extremes of the  $\alpha$ -level set  $A_\alpha$  of the  $FN$   $A$ .

Although  $FN$ s can be represented by very general functions, we prefer to restrict our study to  $FN$ s (general enough) with simple shapes because, in practice, these are the  $FN$ s that are most frequently used in practical applications. For instance, given four real numbers  $a_1, a_2, a_3$ , and  $a_4 \in R$  such that  $a_1 \leq a_2 \leq a_3 \leq a_4$ , a trapezoidal fuzzy number (for short, a  $TFN$ ), denoted by  $A = (a_1/a_2/a_3/a_4)$ , is the  $FN$  defined by (as shown in Figure 1):

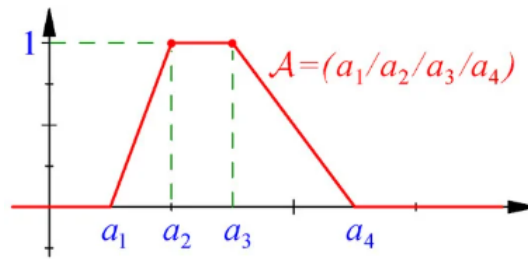


Figure 1: An example of  $FN$ s

The real numbers  $a_1, a_2, a_3$ , and  $a_4$  are usually called the corners of the  $FN$   $A$  because, when  $a_1 < a_2 < a_3 < a_4$ , they correspond to the vertices of the trapezoid that we obtain when the real function  $A$  is plotted. Triangular  $FN$ s, denoted by  $(a_1/a_2/a_4)$ , are trapezoidal  $FN$ s such that  $a_2 = a_3$ . The previous definition extends the notion of a real number to the fuzzy setting because when  $a_1 = a_2 = a_3 = a_4 = r \in R$ , the  $FN$   $r = (r/r/r/r)$  (which takes the value 1 if  $x = r$  and the value 0 in any other case) represents the real number  $r$ .

$TFN$ s are appropriate tools in order to represent both the imprecision that is necessarily associated with each measuring instrument and the subjective opinions that several experts could express about a finite set of items. For instance, the  $TFN$   $(8.5/8.7/8.8/9)$  could represent a very good, but imprecise, opinion about the quality of a wine when the range interval  $0, 10$  is considered.

Basic operations on the real line can also be extended to the family  $F$  by Yen's Extension Principle [24], that is, by defining

$$(A \diamond B)(x) = \sup(\{\min(A(s), B(t)) : s \diamond t = x\}) \text{ for all } x \in R,$$

where  $\diamond = \{+, -, \cdot, /\}$  is a traditional operation (notice that the division can only be considered when the real number 0 does not belong to the support of the divisor, see [2, 14, 7]). This definition is equivalent to that obtained by the interval arithmetic with the  $\alpha$ -level sets [1]: for instance, if  $A, B \in F$ , then

$$\begin{aligned} C = A + B, A + B_{[\alpha]} &= \underline{a}_\alpha + \underline{b}_\alpha, \overline{a}_\alpha + \overline{b}_\alpha, c_\alpha = \underline{a}_\alpha + \underline{b}_\alpha, \overline{c}_\alpha = \overline{a}_\alpha + \overline{b}_\alpha \\ C = A + B, A + B_{[\alpha]} &= \min \Delta_{AB}^\alpha, \max \Delta_{AB}^\alpha, \\ \text{where } \Delta_{AB}^\alpha &= \underline{a}_\alpha \underline{b}_\alpha, \underline{a}_\alpha \overline{b}_\alpha, \overline{a}_\alpha \underline{b}_\alpha, \overline{a}_\alpha \overline{b}_\alpha. \end{aligned}$$

## 5 Findings

### 5.1 Descriptive statistics of experts

In the table below, the frequency distribution related to general demographic characteristics of experts is shown:

Table 1: Frequency distribution related to general demographic characteristics of experts

Frequency	Percent	Frequency	Description	Variable
93		12	Man	gender
7		1	Female	
46		6	35 to 45 years	Age
38		5	45 to 55 years	
16		2	Above 55 years	
46		6	10 to 15 years	work experience
38		5	15 to 20 years	
16		2	Above 20 years	
38		5	Masters	education
53		7	Masters	
7		1	P.H.D	

### Fuzzy Delphi method

We intend to use this method to reveal the relationship between the criteria and the subject of the research, as well as the importance of each criterion. 1- The first stage: In this stage, we ask the experts to determine the relationship of the aggregated criteria with the research topic through the Likert scale. 2- The second stage: In this stage, we ask the experts to confirm and screen the related criteria, in the sense that they choose the most important criteria with their opinion. 3- The third stage: the less important criteria that were not approved by the experts based on the threshold value of 5. They are removed in the sense that if the average score of each criterion is less than 5, that criterion is removed.

Extraction of independence criteria in an integrated way

In this part, the criteria extracted from 1- background review 2- interview of informants 3- existing standards (current situation) are aggregated and by removing duplicate items and removing criteria that could not be measured and evaluated such as acceptance of gifts, social trust, competition, political pressure, ethics Professionalism, social conservatism, as well as the elimination of criteria that go beyond the rating model, such as the non-interference of the executive branch in the administration and management of the supervisory body in institutions, the existence of supervisory institutions in audit institutions, the relationship between audit institutions and regulatory bodies, providing evidence of independence in the law, etc. Finally, the independence criteria include 34 items as follows: 1- Deferred fees 2- Long tenure 3- Fees for non-audit services 4- Ratio of fees received from an employer to total income 5- Requirement to communicate with the previous auditor 6- Requiring the employer to disclose the reason for changing the auditor 7- Establishing punitive systems 8- Completion of independence form by partners and employees before work 9- Requirement to disclose kinship relationship 10- Evidence and documents of timely reporting of conditions threatening independence 11- Stock company or not Stock Exchange 12- Auditor licensed by the Stock Exchange 13- Non-interference of the company in the selection of the auditor 14- Documents and evidence of warnings during the work for the auditor team 15- Investigation of low fees 16- Requirement to disclose fees 17- Pursuing the manager responsible for violation of independence 18- Committee Self-employed audit 19- The size of the company under consideration 20- The right to choose the manager 21- Written confirmation from the employees about compliance with the policies and procedures of the institution 22- The size of the audit institution 23- Legal orientation 24- Full compliance with the code of professional conduct 25- Card allocation by legal authorities 26- Failure to pay attention to the standard Auditing 27- Type of auditor's opinion during one year separately 28- Number of shareholders 29- Private or public company 30- Auditor's training regarding independence 31- Evidences and documents examined in accepting and continuing work 32- Informing the employees of the requirements related to the independence of the institution 33 - Identifying and evaluating conditions of threats to independence and adopting appropriate safety measures 34- Taking appropriate action regarding threats to independence

Fuzzy Delphi method has been used for weighting and importance of independence criteria and including it in the rating model of audit institutions. In this research, fuzzy Delphi was conducted in two rounds, which are given below.

### 5.2 The results of the first phase of fuzzy Delphi

At this stage, a questionnaire including 34 criteria of independence was given to the members of the expert group to express their opinion in the questionnaire. To fuzzify the numbers, first we convert them into a fuzzy number based

on their specific spectrum, then the fuzzy average is obtained from the scores and the fuzzy average is converted into a definite number. The results of all the fuzzification calculations in the first stage of Delphi are in Table 2. In this research, the threshold number is 5. It is considered that the results are given in Table 2 of the results.

Table 2: The results of the first phase of fuzzy Delphi

Condition	Definite average	Fuzzy average			under the criteria
confirmation	0.613	0.857	0.607	0.375	The ratio of fees received from an employer to total income
confirmation	0.667	0.875	0.679	0.446	Fee for non-audit services and its balancing
confirmation	0.655	0.875	0.661	0.429	Check for low fees
confirmation	0.560	0.804	0.554	0.321	Requirement to disclose fees
rejection	0.375	0.607	0.357	0.161	Deferred fees
confirmation	0.613	0.857	0.607	0.375	Non-interference of the company in the selection of the auditor
confirmation	0.690	0.875	0.714	0.482	Card allocation by legal authorities
confirmation	0.625	0.857	0.625	0.393	No right to choose an auditor by the manager
rejection	0.411	0.625	0.393	0.214	Stock or non-stock company
rejection	0.393	0.625	0.375	0.179	Private or public company
rejection	0.458	0.696	0.446	0.232	Number of shareholders
rejection	0.429	0.661	0.411	0.214	The size of the company under consideration
confirmation	0.595	0.839	0.598	0.357	The audit committee of the employer
confirmation	0.685	0.893	0.696	0.464	Written confirmation from employees about compliance with policies and procedures
confirmation	0.655	0.875	0.661	0.429	The size of the audit firm
confirmation	0.619	0.839	0.625	0.393	The type of auditor's opinion during one year separately
confirmation	0.732	0.929	0.750	0.518	Auditor training regarding independence
confirmation	0.613	0.821	0.625	0.393	Evidence and documents examined in acceptance and continuation of work
confirmation	0.679	0.875	0.696	0.464	Informing the employees about the requirements related to the independence of the institution
confirmation	0.685	0.857	0.714	0.482	Identifying and evaluating conditions that threaten independence and adopting safety measures
confirmation	0.536	0.732	0.536	0.339	Taking appropriate action on threats to independence
confirmation	0.500	0.696	0.500	0.304	Pursuing the manager responsible for violation of independence
confirmation	0.506	0.714	0.500	0.304	Documentation and warning evidence during work for the audit team
rejection	0.482	0.679	0.482	0.286	Authorized auditor of the stock exchange
confirmation	0.542	0.714	0.554	0.357	Evidence and documents of timely reporting of conditions threatening independence
confirmation	0.595	0.786	0.607	0.393	Completion of independence form by partners and employees before work
confirmation	0.500	0.696	0.500	0.304	Requirement to communicate with the previous auditor
confirmation	0.542	0.750	0.536	0.339	Long tenure
rejection	0.435	0.643	0.429	0.232	The requirement of the employer to disclose the reason for changing the auditor
rejection	0.446	0.643	0.446	0.250	Requirement to disclose kinship relationship
confirmation	0.524	0.732	0.518	0.321	Establishing punitive systems for auditors
rejection	0.405	0.607	0.393	0.214	Failure to pay attention to auditing standards
confirmation	0.548	0.750	0.554	0.339	Full compliance with professional code of conduct
confirmation	0.506	0.714	0.500	0.304	Legality of the auditor

In Table 3, the fuzzy and definite mean of the second phase of fuzzy Delphi is given. Also, in this step, the difference between the definite mean of the second and the first phase is also given. According to Cheng Lin and his colleagues, if the difference between the two stages of polling is less than the very low threshold (0.1), the polling process is stopped, that is, we have reached a consensus. Table 1 shows that in all the extracted criteria, the average difference is less than 0.1, so we have reached a consensus, these criteria were chosen as highly important criteria for ranking audit institutions.

### 5.3 Rating model of audit institutions

At this stage, we base the above criteria on the ranking model of audit institutions because, as we have stated, independence criteria are not included in the ranking of audit institutions. Therefore, we present this model to the samples of the statistical population by bringing the criteria of independence for confirmation and consolidation through a questionnaire. The statistical samples of this research include 286 people from the partners of auditing institutions, members of the Iranian Certified Public Accountants Society. Given that 197 people answered the questionnaires, the return rate of the questionnaires is 68%, which is an acceptable rate.



Table 3: The results of the second phase of fuzzy Delphi

difference	Condition	Definitive average of stage 1	Definitive average of stage 2	Phase 2 fuzzy average			under the criteria
.03	confirmation	0.613	.64	.89	.64	.39	The ratio of fees received from an employer to total income
.02	confirmation	0.667	.68	.89	.70	.46	Fee for non-audit services and its balancing
.01	confirmation	0.655	.67	.89	.68	.43	Check for low fees
.02	confirmation	0.560	.58	.82	.57	.34	Requirement to disclose fees
-.04	rejection	0.375	.34	.57	.32	.13	Deferred fees
.02	confirmation	0.613	.64	.88	.64	.39	Non-interference of the company in the selection of the auditor
.03	confirmation	0.690	.72	.91	.75	.50	Card allocation by legal authorities
.01	confirmation	0.625	.64	.86	.64	.41	No right to choose an auditor by the manager
-.04	rejection	0.411	.38	.59	.36	.18	Stock or non-stock company
-.03	rejection	0.393	.36	.59	.34	.16	Private or public company
-.04	rejection	0.458	.42	.66	.41	.20	Number of shareholders
-.05	rejection	0.429	.38	.61	.36	.18	The size of the company under consideration
.03	confirmation	0.595	.63	.88	.63	.38	The audit committee of the employer
.03	confirmation	0.685	.71	.91	.73	.50	Written confirmation from employees about compliance with policies and procedures
.02	confirmation	0.655	.68	.89	.70	.45	The size of the audit firm
.03	confirmation	0.619	.65	.88	.66	.41	The type of auditor's opinion during one year separately
.02	confirmation	0.732	.76	.95	.79	.54	Auditor training regarding independence
.05	confirmation	0.613	.66	.86	.68	.45	Evidence and documents examined in acceptance and continuation of work
.02	confirmation	0.679	.70	.88	.73	.50	Informing the employees about the requirements related to the independence of the institution
.02	confirmation	0.685	.70	.89	.73	.48	Identifying and evaluating conditions that threaten independence and adopting safety measures
.02	confirmation	0.536	.56	.77	.57	.34	Taking appropriate action on threats to independence
.04	confirmation	0.500	.54	.75	.54	.32	Pursuing the manager responsible for violation of independence
.01	confirmation	0.506	.52	.73	.52	.30	Documentation and warning evidence during work for the audit team
-.07	rejection	0.482	.42	.63	.41	.21	Authorized auditor of the stock exchange
.04	confirmation	0.542	.58	.75	.59	.39	Evidence and documents of timely reporting of conditions threatening independence
.02	confirmation	0.595	.62	.80	.64	.41	Completion of independence form by partners and employees before work
.08	confirmation	0.500	.58	.77	.59	.38	Requirement to communicate with the previous auditor
.04	confirmation	0.542	.58	.79	.59	.38	Long tenure
-.05	rejection	0.435	.39	.61	.38	.18	The requirement of the employer to disclose the reason for changing the auditor
-.06	rejection	0.446	.39	.61	.38	.18	Requirement to disclose kinship relationship
-.01	confirmation	0.524	.52	.73	.52	.30	Establishing punitive systems for auditors
-.06	rejection	0.405	.35	.57	.32	.14	Failure to pay attention to auditing standards
.08	rconfirmation	0.548	.63	.82	.64	.43	Full compliance with professional code of conduct
.06	rconfirmation	0.506	.57	.79	.57	.34	Legality of the auditor

## 6 Discussion

As stated, independence is one of the most important characteristics of an auditor, in the absence of which, the audit report is of poor quality and lacks necessary credibility. The findings of this research, using experts' opinions and statistical samples, showed that out of 34 characteristics of auditor independence, except 8 cases are applicable in audit institutions. In other words, we found that we can expand and expand the criteria of independence of the auditor to the criteria of the independence of auditing institutions and consider and implement them in auditing institutions through the ranking of the society of certified public accountants of Iran, because one of the strong evidences of the weakness and not seeing the problem The auditor's independence was observed in the evaluation of the stock exchange organization and the ranking of the society of certified accountants of Iran in the rating checklists

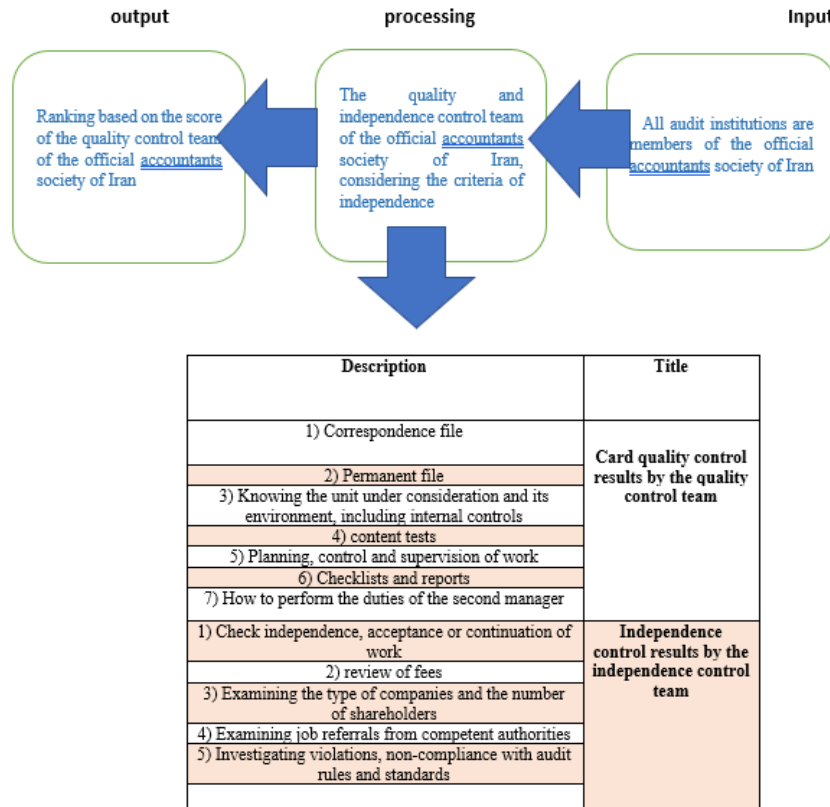


Figure 2: Ranking pattern of audit institutions with independence criteria

of these two institutions, and these checklists will be the criteria for the superiority of one institution over another, as an example in the audit quality control questionnaire from 1000 relevant points (that the institutions must obtain and according to their points be placed in one of the ranks of *A*, *B*, *C* and *D*), only 10 points are allocated to the independence of the auditor, that is, 1% of the 100% audit concepts.

As we know, the concept of independence of the auditor was born at the same time as the concept of auditing, and this concept is one of the key issues of auditing, but due to the fact that auditors gradually turned to auditing institutions and formed an auditing institution, this concept has lost its place. In practice, it was “lost” and “merely” as a scientific issue, it was brought to the attention of researchers. This issue made researchers tend to the direction that the effects of audit quality, audit report, audit fee, etc., on independence find the auditor and they refused to provide an integrated model that includes all these criteria and fills and completes a knowledge gap and expresses the concept of independence in auditing institutions.

In other words, today the concept of independence of the auditor alone (due to the expansion of audit institutions) has lost its main application and functions, and the knowledge gap in the field of the independence of audit institutions and not the independence of the auditor is quite evident. Through their efforts, researchers and researchers have obtained the independence of the auditor to be collected in an integrated model so that this concept is both practical and the basis for researchers who want to generalize and expand this concept from the auditor to the audit institution and other models. In this regard, it should be presented and the direction of the future researches should be oriented towards the presentation of models of independence and independence of auditing institutions.

The result that can be stated can be mentioned in several ways. First, the implementation of the same criteria of auditor independence in applicable audit institutions and the concept of independence can be expanded and developed by bringing the concept of independence to audit institutions in a practical model. Secondly, the knowledge and scientific vacuum of the concept Independence in audit institutions is fulfilled to some extent with this approach and attitude. Thirdly, an efficient model has been presented to solve problems related to the selection and fees of audit institutions, appropriate distribution of clients of audit institutions, etc. in a scientific way.

Because if these characteristics are not collected in one place and are scattered and individually under the title of

Table 4: details of the ranking model with independence criteria

Description of the examined topics	
1-	Check independence, acceptance or continuation of work:
1-1-	Evidences and documents reviewed in accepting and continuing work:
1-2-	Correspondence with the previous auditor and review the received response and comply with the rules
1-3-	Completion of the independence form for partners and professional employees before starting work.
1-4-	Written confirmation from employees about the policies and procedures of the institution
1-5-	Audit firm size score
1-6-	The type of auditor's opinion separately during one year
1-7-	Auditor and staff training during the year regarding independence
1-8-	Communicating independence requirements to employees with evidence
1-9-	Identification and assessment of conditions of threats to independence and adoption of safety measures
1-10-	Taking appropriate action on threats to independence during the year with evidence
1-11-	Pursuing the manager responsible for the violation of independence with documentation
1-12-	Documents and evidence of timely reporting of conditions threatening independence
1-13-	Examining the long-term tenure of auditors in companies
2-	Fee check:
2-1-	The ratio of the fee received from an employer to the total income
2-2-	The ratio of non-auditing service fees to total income
2-3-	Examination of low fees
2-4-	Disclosure of fees in the institution's financial statement separately
3-	Choosing an auditor by another authority:
3-1-	Allocation of audit work by authorities other than the company
3-2-	No right to choose an auditor by the manager
4-	types of companies:
4-1-	Existence of audit committee in the investigated companies
5-	Violations, failure to comply with the law:
5-1-	having regulations and disciplinary violations
5-2-	Complying or not complying with the code of professional conduct without registering the violation
5-3-	Investigating suspicions and criminal punishment of partners of the institution with inquiries

independence of the auditor and not the independence of the auditing institutions, we will rarely see the independence of the auditing institutions, and currently the only place where we can see the independence characteristics under one model. The practical and practical way of summarizing and taking into account the ranking of audit institutions is that this is done by the community of certified accountants. If these characteristics and criteria are considered in the ranking of audit institutions and applied in a practical way, we can achieve the independence of the institutions. We will raise and maintain auditing. The ranking of auditing institutions can be more appropriate by considering the characteristics of independence and bring fair distribution of work.

## 7 Suggestions for future research

Considering that the change in any group and organization may face some resistance, it is better that the researchers find the obstacles to the implementation of this model in the society of certified accountants of Iran. brought them closer to each other regarding the single and integrated ranking of audit institutions and what are the obstacles of the lack of coordination of these professional organizations in the separate ranking and scoring of audit institutions.

And as a last suggestion, how many points should be considered for independence and its criteria in the ranking, so that these criteria can be practically used in the ranking of auditing institutions.

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