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Identifying Criteria of Internal Audit Quality for Iranian listed Companies

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ABSTRACT

The present research aims to identify Criteria of Internal Audit Quality for Iranian listed Companies. For achieving this purpose, inductive and deductive approaches are utilized. In current research, by using Delphi research method, preparation of scored checklists and a survey of 16 accounting and financial management professional experts and 20 internal auditors, it attempts to identify Iranian internal audit quality criteria, so as to design a appropriate model. In the next stage, Delphi analysis was used to reach theoretical adequacy, 8 out of 31 dimensions were eliminated and the remaining 23 dimension were included in interpretive structural analysis phase (ISM) to improve qualitative functions of internal auditing within the framework of three main categories: leadership factors, socio-cultural factors, and process factors and individual training. The results revealed that the most effective item(s) of strategic factors were approval of plan, budget and internal audit reward, and the most effective item of socio-cultural factors was strengthening audit culture symbols and values, and the most effective items of process factors and individual training were internal audit quality upgrade, improvement of behavioral capabilities and decision-making of internal auditors.

Keywords:

Internal audit quality, Tehran Stock Exchange constitution, Content examination, Interpretive structural analysis.

1. Introduction

One of the requirements of a healthy competition is the accessibility of reliable information for investors and other stock market stakeholders. Reliable and transparent information is very effective on stock market performance. The ambiguity or shortage of information results in miss-allocation of resources and increases transactions costs. Information, as the inseparable part of decision-making process, can help with optimization of resources allocation if it is transparent and accessible, and it finally results in market transparency and efficiency as the final goals of stock market (Bahramian, 2011).

An auditor's report on the statements and other financial information of companies is an important tool for ensuring the reliability of companies' information. Independent auditors validate financial statements and clear financial information (Chang et al., 2019). Hence, financial statements auditing by independent auditors is one of the leading requirements of different stock markets all over the world. Within the past decades, some financial scandals like accounting scandal of Enron and worldcom companies challenged the independence of auditors and accounting supervision entities propose regular substitution of auditors as a good practical solution (Aghayee et al., 2015).

Within the last three decades, internal auditing has undergone great changes in the world. In Iran, however, the changes have not been done because of the public and isolated Iranian economy and absence of multinational companies and internal auditing is still considered as a formal document in many companies (Maham and Tak Roosta, 2011). Internal auditing is not only an effective element in knowledge-based and global economic system and related to profit-making and commercial enterprises, but also it can be applied by public units to help management make sure of proper implementation of directions and policies within the organization (Javadi and Talebnia, 2016).

The quality of auditing and factors affecting it have received a lot of attention by investors, managers, financial analysts, researchers and loan-payers from long ago. A high-quality auditing improves reliability and credibility of financial reporting and thereby increasing the efficiency of financial markets (Harris and Williams, 2020). Reliable information inspires trust in its users. This finally results in making appropriate decisions to allocate resources by investors or other stakeholders and this in part improves the efficiency of stock market (Bozorg Asl, 2001). The outcomes of internal control may include discovery of mistakes and deceptions, reduction in illegal behaviors, improvement of competitive power of companies (Lotfalian and valipour, 2015), improvement of data quality and contribution to creation of commercial infrastructure (Marjani and Alinejad, 2019), reduction in auditing costs (Gramling and Sneider, 2018) (Retinberg et al., 2005). In some countries, due to the importance of internal control as a prevention-better-than-cure factor, it has been included within the corporate structure regulations (Kucheki, 2015). In Iranian stock market, further, the instruction of internal controls of stock publishers was investigated and approved by stock market professional committees, formal accountants community and auditing organization and publicized to all stock market stakeholders (Kabiri and Fakhari, 2016). According to this instruction, companies should establish an appropriate and effective internal control system and evaluate it annually and then reflect the results of their evaluations in a report called "internal controls report" to the market (Umar and Dico, 2018). The management must investigate the effectiveness of internal controls and report the weak points of the controls and deal with its independent audit and finally report the results (Lai et al., 2017). This is a new heavy burden on auditors' shoulders. This heavy load, however, is an appropriate solution to improve financial health and prevention before cure (Hasas Yeganeh, 2013).

Considering the above discussion, the present research aims to design an internal audit quality model based on Iranian Stock market constitution. In the following sections, research literature and theoretical roots are reviewed and then, the methodology of the research is presented. The research results and conclusion come in the final sections.

2. Theoretical background and research review

Internal auditing of an enterprise helps it with achieving its goals using systematic approaches and improvement of resources effectiveness (pit et al., 2013). Internal auditing is a dynamic occupation in today's world (Diganto, 2019). Internal auditors,

however, are not responsible for doing organizational activities (Nakhai and Heidarinasab, 2019). An effective internal audit helps managerial board with evaluation and improvement of risk management, internal control and corporate governing processes and leads to higher benefit for the enterprise (Boseko et al., 2019).

Although the general belief considers the internal controls as a set of actions to prevent employees' cheating, it includes more issues like organizational structural design, and all financial and non-financial directions established by the management to reach organizational goals (Usi and Taktak, 2018). In general, internal control involves methods which are developed to make sure of achieving organizational goals. Of course, no internal control is ideal and its costs should not exceed its benefits. The definition of internal control in public sector is (Spuke, 2018): internal controls include a set of regulations, directions and methods along with units which are responsible for supervision, which are established within an organization in order to assure pre-defined goals achievement for every executive enterprise (Zarei and Abdi, 2010). Each of the policies and methods are called internal control and the whole system is called internal control system (Hasas Yeganeh, 2013).

Internal control helps commercial enterprises with achieving important goals and improving their performance. Organizations should design their internal control systems effectively to assure the improvement of performance (Rahimian, 2013). An effective internal control system, above all, depends highly on directions, methods and agreements. This makes application of judgment necessary (Chang et al., 2020). Managers and internal auditors make judgements for evaluation and supervision of effectiveness of internal control system (Rahimian, 2013).

Numerous studies have dealt with the influence of internal audit quality on financial report or internal audit performance. Afzalnia et al. (2020) conducted a research titled: "Investigation of the influence of audit quality on relationship between internal control weakness and liability cost in companies admitted to Tehran Stock Exchange". The results showed that there is a positive and significant relationship between the two variables and audit quality has a significant inverse influence on relationship between internal control weakness and liability cost of the companies.

Hajiha (2019) conducted a research titled: "Commercial strategy, important weakness of internal controls and delay in publishing audit report". The results revealed that companies with exploratory commercial strategy had important weakness of internal controls in audit report but companies with defensive commercial strategy have less important weakness in internal controls. The results verified the organizational theory which says a company's commercial strategy is a good indication of evaluation of internal controls system strengths.

Rahimi et al. (2017) research titled: investigation of factors affecting weakness disclosure in internal controls of companies admitted to Tehran Stock Exchange. They found that there was a significant negative relationship between internal controls weakness disclosure and response coefficient, i.e. profit response coefficient reduces as weakness in internal controls increases.

Kabiri et al. (2016) research titled: determining factors of internal controls weakness disclosure and its influence on informative asymmetry. The results indicated that return on assets, profitability, financial leverage, risk, company lifetime, non-executive members of managerial board and number of professionals in auditing committee, public shareholders' ownership and main shareholders and audit quality influence on internal controls weakness disclosure.

Momeni's research (2016) titled: "Investigation of the role of auditing committee and internal audit on improvement and quality of financial reporting" showed that formation of an auditing committee as a supervisory tool in companies can increase information quality directly via supervision on financial reporting process and indirectly via attention to internal control and auditing.

Among international studies regarding the research subject, Raja Ahmed et al. (2019) conducted a research titled: "Investigation of the influence of managerial board features on disclosure of risk level and internal controls weakness in Malaysia". The results showed that managerial board characteristics including the size and independence of managerial board and duality of responsibility of managing director plays an effective role in controlling risk and disclosure of internal control weaknesses of Malaysian stock market companies.

Harjoto et al.'s research (2019) titled: the influence of characteristics and independence of managerial board members on the wage and quality of auditing revealed that managerial board characteristics has an indirect influence on audit wage but a direct influence on audit quality. Furthermore, their results revealed that independence of members of managerial board did not influence on wage of auditing but could increase companies' auditing quality.

Chen et al.'s research (2018) titled "Sexual diversity of managerial board and reduction in internal controls weakness found that more women in a managerial board reduce weakness in internal control". This is not due to women's presence in auditing committee. Their presence in managerial board itself, rather than in auditing board, can reduce internal control weaknesses. Their results do not confirm the sensitive mass theory, because they found only one woman present in a managerial board may reduce weakness in internal control.

Berkman and Zouta (2018) research titled: "Investigation of the influence of auditing committee characteristics and possibility of negative occurrences" revealed that a larger size of auditing committee has a positive and significant influence on possibility of negative occurrences in a company. Moreover, the expertise, experience and independence of audit committee members have a negative and significant influence on the possibility of negative occurrences.

Chen et al.'s research (2017) titled "The investigation of the influence of managerial board independence on companies internal controls weakness in China" revealed that there is a negative and significant relationship between managerial board independence and disclosure of internal control weakness. They also found that there is a negative relationship between a managing director with dual duty (common position of managing director and board of managers' chairman) and disclosure of internal controls weakness. Finally, they found that managerial board independence had a significant relationship with smallest weak points of internal controls of companies and can impact on-time amendment of weaknesses of internal controls.

Jagi et al. (2016) research titled: investigation of relationship between internal audit quality and auditor's expertise with profit quality in industry revealed that there was a significant relationship between internal audit quality and profit quality. Further, there was a significant relationship between auditor's expertise in industry and profit quality.

3. Research methodology

This is a developmental study because it aims to delve into the content and theoretical screening in order to improve the effectiveness of internal audit quality, which is a subject of little attention received, although it is a very important subject because it can help improve the transparency of financial reporting. In terms of data type, this is a compound research because it is a inductive-deductive research. In the qualitative data analysis section, it deals with theoretical roots of effective functions of internal auditing quality with a inductive approach, and then, with a deductive approach, it characterizes the identified items in the target society i.e. internal auditors of companies of Tehran Stock Market. A Meta-analysis was used in the qualitative section of this research, which includes steps to reach some items (dimensions).

3.1. Statistical population and sampling method

The statistical population, sampling method and sample size are separated into qualitative and quantitative sections. In the qualitative section, the target population included studies regarding the research subject and 16 accounting and financial management professionals in academic environment who were involved in the analysis and identification of content dimensions based on meta-analysis process, critical evaluation and Delphi analysis. In the quantitative section, the target population included 20 internal auditors of stock market companies. This statistical population size is acceptable considering the interpretive and structural comprehensive model analysis. The aim of the involvement of this population was to explain the results of the qualitative section in Tehran stock market companies. In fact, because the method is an analysis based upon evaluation of complex systems in different levels and must be done by specific criteria like specialized knowledge and experience of participants, a mutual matrix questionnaire with 15 to 30 participants was used to prevent creation of a lot of dubious responses. Researchers like Singe and Cont (2011), Malon (2014), Ramesh et al. (2008) and Atri et al. (2013)

predicted the appropriate sample size to be about 15 to 25 respondents and proposed accessible sampling method considering the filters in accordance with research nature.

4. Meta-analysis and Delphi findings

In order to conduct a meta-analysis, information banks and research references were used first of all. Based upon ultra-combination and Delphi analysis process, this study aims to explain the items and dimensions related to functions of internal audit quality. Hence, the following information banks and references were used to extract similar studies regarding the research subject.

Table 1. Information bank bases and formal research references

Iranian information banks	International information banks
Sciencedirect	MAGIRXN
Emeraldinsight	NOORSOFR
OnlineLibrary	SID
Aaajournals	All related press and journals

A number of reliable and valid studies in 2016-2020 time interval were determined by ultra-combination evaluation process and protocol. In other words, in order to find similar studies using the above references, related studies were identified.

After screening similar studies in terms of title, content and analysis, 12 studies were used to evaluate and determine items and dimensions of improvement of internal audit quality. In the next step, using Sterling approach (2001), the contents were classified and separated within dimensions and items of improvement of internal audit quality. According to this method, 12 confirmed studies are processed by 16 professionals to reach an integrated understanding of the research in terms of 10 criteria: research targets, methodology logic, research plan, sampling, data gathering, reflectivity, analysis precision, theoretical statement of findings and research value.

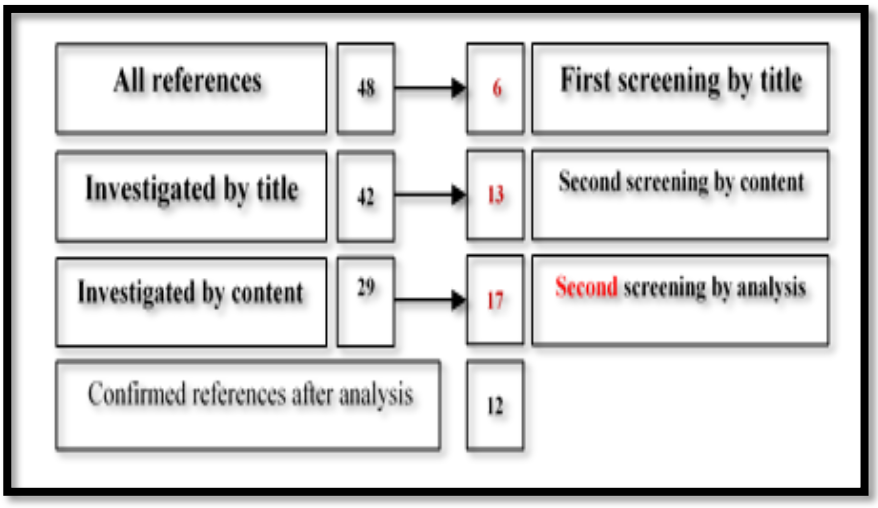

Figure 1. The process of screening studies regarding the research target to identify items and dimensions

Table 2. Process of evaluation of confirmed studies to determine research items and dimensions

Critical evaluation criteria/studies	Research origin											
	International studies								Iranian studies			
	1	2	3	4	5	6	7	8	9	10	11	12
	Bi et al.(2020)	Etrich et al. (2019)	Chang et al. (2019)	Luckinen et al. (2018)	Suh and Mainohini (2018)	Liu et al. (2019)	Chen et al. (2016)	Zhang and Cao (2016)	Nikbakht and Ghods Hasan Abad (2019)	Moradi and Bahri Sales (2019)	Okhravi Joufan et al. (2018)	Mennati and Zaman (2018)
Research goal	2	3	5	3	4	3	2	3	3	4	2	3
Research method logic	2	4	4	3	4	3	3	4	5	5	3	3
Research design	2	3	3	3	3	3	2	3	4	4	2	4
Sampling method	3	4	3	2	4	4	3	3	3	4	2	3
Gathering method	2	3	4	3	4	3	3	2	4	4	2	4
Findings generalization	2	4	5	2	3	4	3	3	3	4	3	3
Moral	2	3	4	2	4	4	2	2	3	4	3	4
Statistical analysis method	2	3	4	3	4	3	3	3	3	3	2	4
Theoretical capability	2	3	4	4	3	4	3	2	4	4	4	3
Research value	3	4	5	3	4	4	3	3	4	5	2	3
Sum	**22**	**36**	**41**	**28**	**37**	**34**	**27**	**29**	**36**	**43**	**25**	**35**

The results of the analysis revealed that 5 studies did not acquire enough points and were eliminated from investigation (Bi et al. (2020), Luckinen et al., 2018), Chen et al. (2016), Jang and Kao (2016), and Okhravi Jughan et al. (2018)). In the following, Sterling method will be used to extract research items. Thus, the following score method is used to determine the functional dimensions of internal audit quality. According to this method, all subsidiary criteria extracted from confirmed studies are written in the columns of a Table and the name of the confirmed studies' author(s) are written in rows. Based on the use of every researcher if the written subsidiary criteria in columns, a tick sign is put, and then the scoring of every tick in columns is summed and higher scores are used as research items and dimensions.

The analysis revealed that three dimensions: socio-cultural factors, leading factors and process factors had the greatest frequencies in the 7 confirmed studies and they were used as the main criteria to determine the dimensions of internal audit quality. After investigation of the confirmed studies theoretical roots, the dimensions were determined in Table 4.

Then, theoretical saturation point was achieved by means of Delphi analysis in order to make sure of the identified items and dimensions. Hence, the dimensions were given to professionals for surveying within the framework of a 7-choice checklist. Table 5 shows the results of Delphi analysis.

Delphi analysis eliminated 4 dimensions because they received scores below 5 on a 7-point Likert scale and their contingency coefficient was below 0.5. again, Delphi analysis was conducted to reach theoretical adequacy to finalize the items and dimensions and prepare a theoretical framework for the research and enter interpretive and structural analysis.

As it can be seen, all dimensions were confirmed in the second round of Delphi analysis and this shows theoretical adequacy of dimensions of internal audit quality functions. According to the items and dimensions extracted, the conceptual framework of contextual factors of improvement of internal audit quality functions is as follows

Table 3. Explanation of main dimensions of internal audit quality improvement

Research origin	Researchers	Structural factors	Socio-cultural factors	Managerial factors	Leadership factors	Process factors	Legal factors
International	Elrich et al. (2019)	-	☑	☑	-	☑	-
	Chang et al. (2019)	☑	-	-	☑	☑	-
	Suh and Mateo-Beni (2018)	☑	☑	-	☑	-	☑
	Liu et al. (2018)	-	☑	☑	☑	☑	☑
Iranian	Nikbakht and Ghods Hasan Abad (2019)	-	-	-	☑	-	-
	Moradi and Bahri Sales (2019)	-	☑	-	☑	☑	-
	Mennati and Zaman (2018)	☑	☑	-	☑	☑	-
Sum		**3**	**5**	**2**	**6**	**5**	**2**

Table 4. Items of internal audit quality functions

Main constructs	items
Leadership factors	Managerial board or managing director's perception of supporting internal auditing functions
	Design of instructions with internal auditors' independence maintenance approach
	Improvement of dynamism of internal auditing committees in freedom of action in effective supervisions
	Reduction of limitations in internal auditing unit access to documents
	Approval of program, budget and reward for internal auditing
	Having a plan based on risk and implementation of internal auditing activities
	Creation of restrictions in appointment and firing internal auditing manager without attention to approved documents
Socio-cultural factors	Improvement of values and symbols of auditing culture in company
	Improvement of educational plans in development of internal auditors' efficiency culture level
	Balancing power gap in evaluation of internal auditing risk
	Compatibility of financial targets and strategies with standards in internal auditing
	Creation of a cultural constitution for internal auditing activities
	Improvement of concordance between corporate cultural traits and behavioral standards and professional ethics of internal auditing
Process and individual education factors	Appointment of knowledgeable and experienced internal auditors
	Periodical evaluation of professional competency of internal auditors
	Periodical extension of educational plans and licenses of internal auditors
	Use of specialized team related to the industry in internal auditors
	Improvement of behavioral capabilities and decision-making of internal audits via structured education
	Improvement of IT effectiveness processes in development of internal auditing functions quality
	Matching behavioral skills with performance skills in internal auditors
	Improvement of learning level in internal auditing functions via free information circulation

Note: A multiple-choice scale (7- point) was used for all items.

Table 5. Delphi analysis process in the first step

Main variables	Dimensions	Average	Contingency coefficient	Con1firmed ☑	Eliminated ☒	Result
Leadership factors	Managerial board or managing director's perception of supporting internal auditing functions	5	0.65	☑	-	Confirmed
	Design of instructions with internal auditors' independence maintenance approach	6	0.90	☑	-	Confirmed
	Improvement of dynamism of internal auditing committees in freedom of action in effective supervisions	15.10	0.75	☑	-	Confirmed
	Reduction of limitations in internal auditing unit access to documents	4	0.40	-	☒	Eliminated
	Approval of program, budget and reward for internal auditing	5	0.65	☑	-	Confirmed
	Having a plan based on risk and implementation of internal auditing activities	5.20	0.80	☑	-	Confirmed
	Creation of restrictions in appointment and firing internal auditing manager without attention to approved documents	5	0.65	☑	-	Confirmed
Socio-cultural factors	Improvement of values and symbols of auditing culture in company	5.10	0.75	☑	-	Confirmed
	Improvement of educational plans in development of internal auditors' efficiency culture level	50.20	0.80	☑	-	Confirmed
	Balancing power gap in evaluation of internal auditing risk	5/10	0.75	☑	-	Confirmed
	Compatibility of financial targets and strategies with standards in internal auditing	5.20	0.20	-	☒	Eliminated
	Creation of a cultural constitution for internal auditing activities	5	0.55	☑	-	Confirmed
	Improvement of concordance between corporate cultural traits and behavioral standards and professional ethics of internal auditing	6	90.0	☑	-	Confirmed
Individual training	Appointment of knowledgeable and experienced internal auditors	5.20	0.82	☑	-	Confirmed
	Periodical evaluation of professional competency of internal auditors	5.10	0.75	☑	-	Confirmed
	Periodical extension of educational plans and licenses of internal auditors	5	0.55	☑	-	Confirmed
	Use of specialized team related to the industry in internal auditors	4	0.40	-	☒	Eliminated
	Improvement of behavioral capabilities and decision-making of internal audits via structured education	5.10	0.75	☑	-	Confirmed
	Improvement of IT effectiveness processes in development of internal auditing functions quality	3	0.28	-	☒	Eliminated
	Matching behavioral skills with performance skills in internal auditors	5.10	0.75	☑	-	Confirmed
	Improvement of learning level in internal auditing functions via free information circulation	5.30	0.85	☑	-	Confirmed

Table 6. Delphi analysis, second round

Main variables	Dimensions	Average	Contingency Coefficient	Confirmed ☑	Eliminated ☒	Result
Leadership factors	Managerial board or managing director's perception of supporting internal auditing functions	5.30	0.85	☑	-	Confirmed
	Design of instructions with internal auditors' independence maintenance approach	6	0.90	☑	-	Confirmed
	Improvement of dynamism of internal auditing committees in freedom of action in effective supervisions	6	0.90	☑	-	Confirmed
	Approval of program, budget and reward for internal auditing	5.25	0.85	☑	-	Confirmed
	Having a plan based on risk and implementation of internal auditing activities	5.20	0.80	☑	-	Confirmed
	Creation of restrictions in appointment and firing internal auditing manager without attention to approved documents	5.20	0.80	☑	-	Confirmed
Socio-cultural factors	Improvement of values and symbols of auditing culture in company	6	0.90	☑	-	Confirmed
	Improvement of educational plans in development of internal auditors' efficiency culture level	5.10	0.75	☑	-	Confirmed
	Balancing power gap in evaluation of internal auditing risk	5.10	0.75	☑	-	Confirmed
	Creation of a cultural constitution for internal auditing activities	6	0.90	☑	-	Confirmed
	Improvement of concordance between corporate cultural traits and behavioral standards and professional ethics of internal auditing	5.30	0.85	☑	-	Confirmed
Process and individual training factors	Appointment of knowledgeable and experienced internal auditors	5.20	0.80	☑	-	Confirmed
	Periodical evaluation of professional competency of internal auditors	6	0.90	☑	-	Confirmed
	Periodical extension of educational plans and licenses of internal auditors	5.20	0.80	☑	-	Confirmed
	Improvement of behavioral capabilities and decision-making of internal audits via structured education	5.30	0.85	☑	-	Confirmed
	Matching behavioral skills with performance skills in internal auditors	5.10	0.75	☑	-	Confirmed
	Improvement of learning level in internal auditing functions via free information circulation	5.25	0.85	☑	-	Confirmed

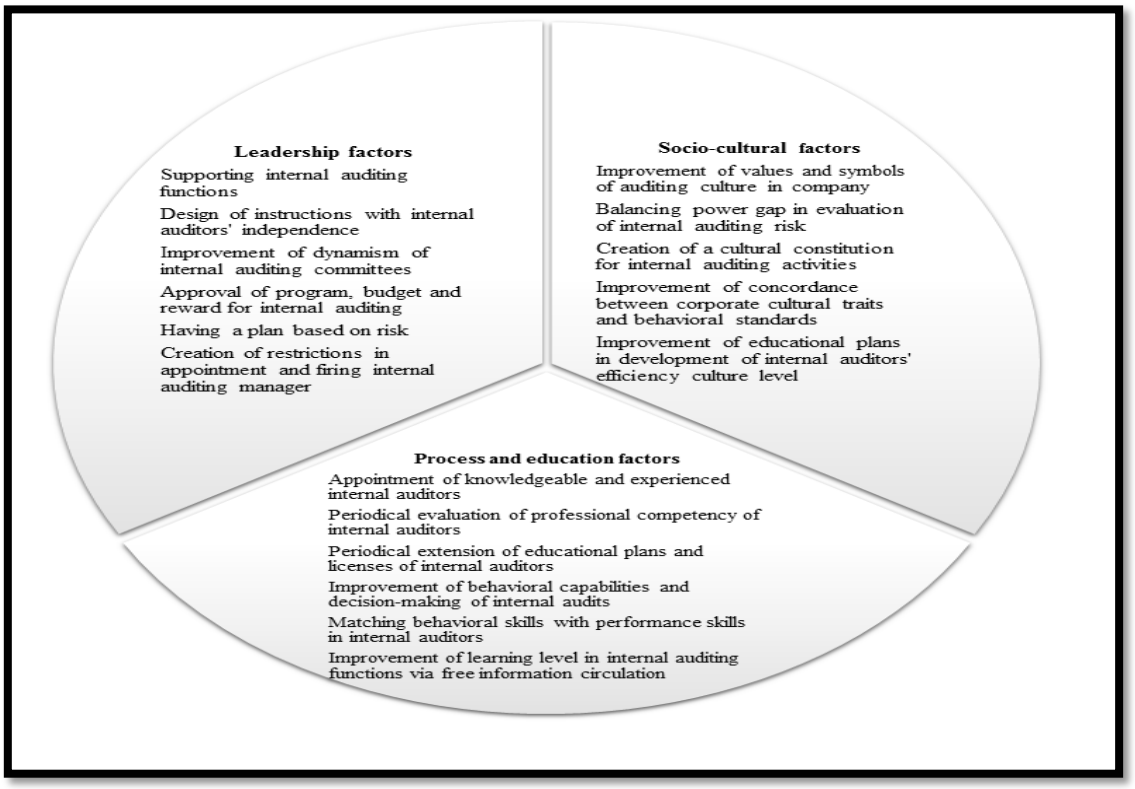

Figure 2. The framework extracted from meta-analysis and Delphi analysis

5. Findings of comprehensive interpretive and structural comprehensive model

In this step, panel members are asked to analyze a matrix questionnaire in order to conduct a interpretive and structural comprehensive analysis. First, the dimensions verified in Delphi analysis should be coded.

As it can be seen in Table 7, the confirmed dimensions were represented by abbreviations to form a structural self-interactive matrix. In this step, the opinions of 20 internal auditors of Stock Market companies regarding the relationships between the dimensions were compared. Thus, "mode" criterion was used, i.e. the relationship with the most frequency from professionals' viewpoints out of the four possible relationships between dimensions was written in the final Table. To determine the relationship type, the literature proposes that different managerial techniques like brain storming and nominal group technique should be used (Senge et al., 2013). The symbols in Table 8 can be used to determine the relationship type:

After determination of conceptual relationships based on mode, the following Table (Table 10) is used to create achievement matrix.

In other words, achievement matrix can be created by converting structural matrix relationships symbols into 0 and 1 numbers based on the following Table.

After creation of this matrix and to investigate other dimensions of indirect relationships between dimensions, which is the advantage of interpretive and structural comprehensive model analysis (TISM) over interpretive/structural model (ISM), we did as follows. In other words, in order to upgrade interpretive structural analysis to a inclusive interpretive structural analysis, every pair comparison must be interpreted by answering the interpretive question mentioned in the previous step. For pair comparison, the ith dimension was compared mutually with all elements from (i+1)ftheth to the nth one. For every relationship, yes "Y" or no "N" is given and the reason for the answer is stated in case of a positive answer. If the answer is no "N", however, the pair variables must be commented.

Table 7. Abbreviation coding of the confirmed dimensions

Dimension	Abbreviation
Managerial board or managing director's perception of supporting internal auditing functions	E1
Design of instructions with internal auditors' independence maintenance approach	E2
Improvement of dynamism of internal auditing committees in freedom of action in effective supervisions	E3
Approval of program, budget and reward for internal auditing	E4
Having a plan based on risk and implementation of internal auditing activities	E5
Creation of restrictions in appointment and firing internal auditing manager without attention to approved documents	E6
Improvement of values and symbols of auditing culture in company	E7
Improvement of educational plans in development of internal auditors' efficiency culture level	E8
Balancing power gap in evaluation of internal auditing risk	E9
Creation of a cultural constitution for internal auditing activities	E10
Improvement of concordance between corporate cultural traits and behavioral standards and professional ethics of internal auditing	E11
Appointment of knowledgeable and experienced internal auditors	E12
Periodical evaluation of professional competency of internal auditors	E13
Periodical extension of educational plans and licenses of internal auditors	E14
Improvement of behavioral capabilities and decision-making of internal audits via structured education	E15
Matching behavioral skills with performance skills in internal auditors	E16
Improvement of learning level in internal auditing functions via free information circulation	E17

Table 8. Conceptual relationships in formation of structural self-interactive matrix

Symbol	Symbol concept
V	I results in j (row resulting in column)
A	J results in I (column resulting in row)
X	There is a mutual relationship between I and j.
O	No valid relationship exists.

Therefore, the finalized self-interactive structural matrix is as follows:

Table 9. Finalized self-interactive structural matrix

	E17	E16	E15	E14	E13	E12	E11	E10	E9	E8	E7	E6	E5	E4	E3	E2	E1
E1	V	O	O	O	O	O	O	O	O	A	O	O	O	O	V	V	1
E2	V	O	O	O	O	O	O	O	O	O	O	O	O	O	V	1	
E3	V	O	O	O	O	O	O	O	O	O	O	O	O	O	1		
E4	O	O	O	O	V	O	O	V	O	V	O	O	V	1			
E5	O	O	O	O	O	O	O	O	O	V	O	O	1				
E6	O	O	V	V	A	O	V	O	O	O	A	1					
E7	O	O	V	V	A	V	V	O	V	V	1						
E8	O	V	O	O	O	A	A	A	A	1							
E9	O	O	O	O	O	O	V	O	1								
E10	O	O	O	O	O	O	O	1									
E11	O	O	A	A	O	A	1										
E12	O	O	A	A	O	1											
E13	O	O	V	V	1												
E14	O	O	X	1													
E15	O	O	1														
E16	V	1															
E17	1																

Table 10. Conversion of conceptual relationships into numbers

Conceptual symbol	Conversion of conceptual symbols into quantitative numbers
V	The cell for this pair in achievement matrix receives number 1 and its opposite cell receives number 0.
A	The cell for this pair in achievement matrix receives number 0 and its opposite cell receives number 1.
X	The cell for this pair in achievement matrix receives number 1 and its opposite cell receives number 1.
O	The cell for this pair in achievement matrix receives number 0 and its opposite cell receives number 0.

Table 11. chievement matrix creation

	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12	E13	E14	E15	E16	E17
E1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
E2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
E3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
E4	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1
E5	1	1	1	0	1	0	0	1	0	0	0	0	0	0	0	1	1
E6	1	1	1	0	0	1	0	1	0	0	1	1	1	0	1	1	1
E7	1	1	1	0	0	1	1	1	1	0	1	1	0	0	0	1	1
E8	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	1	1
E9	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0	1	1
E10	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	1	1
E11	1	1	1	0	0	0	0	1	0	0	1	0	1	0	1	1	1
E12	1	1	1	0	0	0	0	1	0	0	1	1	0	0	0	1	1
E13	1	1	1	0	0	1	1	1	1	0	1	1	1	0	1	1	1
E14	1	1	1	0	0	0	0	1	0	0	1	1	1	1	0	1	1
E15	1	1	1	0	0	0	0	1	0	0	1	1	1	0	1	1	1
E16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
E17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

Table 12. Paired comparison between dimensions based on matrix form

No.	Pair comparison	YES/NO	Description of impact
Managerial board or managing director's perception of supporting internal auditing functions			
1	E1-e2	Yes☒ No ☐	Managerial board or managing director's perception of supporting internal auditing functions is a reason for maintaining independence
2	E2 – e1	Yes☐ No ☒	
3	E1 – e3	Yes☒ No ☐	Managerial board or managing director's perception of supporting internal auditing functions is a reason for improvement of dynamism of internal auditing committees quality
4	E3 – e1	Yes☐ No ☒	
5	E1 – e4	Yes☒ No ☐	Managerial board or managing director's perception of supporting internal auditing functions is a reason for approval of auditing budget, plan and reward
6	E4 – e1	Yes☐ No ☒	
7	E1 – e5	Yes☒ No ☐	Managerial board or managing director's perception of supporting internal auditing functions is a reason for having risk-based plan
8	E5 – e1	Yes☐ No ☒	

No.	Pair comparison	YES/NO	Description of impact
9	E1 – e6	Yes☒ No ☐	Managerial board or managing director's perception of supporting internal auditing functions is a reason for limitations in appointing and firing internal auditing manager
10	E6 – e1	Yes☐ No ☒	
11	E1 – e7	Yes☒ No ☐	Managerial board or managing director's perception of supporting internal auditing functions is a reason for improving values and symbols of auditing in company
12	E7 – e1	Yes☐ No ☒	
13	E1 – e8	Yes☒ No ☐	Managerial board or managing director's perception of supporting internal auditing functions is a reason for improvement of educational and cultural plans
14	E8 – e1	Yes☐ No ☒	
15	E1 – e9	Yes☐ No ☒	
16	E9 – e1	Yes☐ No ☒	
17	E1 – e10	Yes☒ No ☐	Managerial board or managing director's perception of supporting internal auditing functions is a reason for preparation of a cultural constitution in company
18	E10 – e1	Yes☐ No ☒	
19	E1 – e11	Yes☐ No ☒	
2۰	E11 – e1	Yes☐ No ☒	
21	E1 – e12	Yes☒ No ☐	Managerial board or managing director's perception of supporting internal auditing functions is a reason for appointing knowledgeable and experienced auditors
22	E12 – e1	Yes☐ No ☒	
23	E1 – e13	Yes☐ No ☒	
24	E13 – e1	Yes☐ No ☒	
25	E1 – e14	Yes☐ No ☒	
26	E14 – e1	Yes☐ No ☒	
27	E1 – e15	Yes☐ No ☒	
28	E15 – e1	Yes☐ No ☒	
29	E1 – e16	Yes☒ No ☐	Managerial board or managing director's perception of supporting internal auditing functions is a reason for improvement of learning level in internal auditors
3۰	E16 – e1	Yes☐ No ☒	
31	E1 – e17	Yes☐ No	

No.	Pair comparison	YES/NO	Description of impact
		☒	
32	E17 – e1	Yes☐ No ☒	

In order to create self-interactive structural matrix (SSIM), the paired comparisons of dimensions of internal audit quality functions are presented in Table 13. The ith dimension was compared with all elements from (i+1)th to the nth dimension mutually. For every relationship, a yes "Y" or no "N" answer was given and the reason for positive answer is presented. Hence, paired relationships interpretive logic was presented in scientifically logical interpretive form. In this step, the relationships are inserted in the form of "-1" or "0" as achievement matrix, which have been presented in Table 12. According to Table 12, squares with "Y" receive number 1 and squares with "N" receive number 0. In fact, this matrix was created by turning SSIM matrix into a bi-value zero and one matrix.

As it can be seen in Table 13, the conceptual symbols assigned based on Mode dimension turned into 0, 1, and 1^* scores. Table 14 shows the influence strength (score 1 obtained from a row) and dependence strength (score 1 obtained from a column):

Table 13. Achievement matrix in terms of transmissibility of relationships between dimensions

	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12	E13	E14	E15	E16	E17
E1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
E2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
E3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
E4	1*	1*	1*	1	1	1*	1*	1	1*	0	1*	1*	1	1*	1*	1*	1*
E5	1*	1*	1*	0	1	0	0	1	0	0	0	0	0	0	0	1	1
E6	1*	1*	1*	0	0	1	0	1*	0	0	1	1	1	0	1	1	1
E7	1*	1*	1*	0	0	1	1	1	1	0	1	1	0	0	0	1	1
E8	1	1*	1*	0	0	0	0	1	0	0	0	0	0	0	0	1	1*
E9	1*	1*	1*	0	0	0	0	1	1	1	1	0	0	0	0	1*	1*
E10	1*	1*	1*	0	0	0	0	1	0	0	0	0	0	0	0	1*	1*
E11	1*	1*	1*	0	0	0	0	1	0	0	1	0	1	0	1	1*	1*
E12	1*	1*	1*	0	0	0	0	1	0	0	1*	1*	0	0	0	1*	1*
E13	1*	1*	1*	0	0	1	1	1*	1*	0	1	1	1	0	1	1*	1*
E14	1*	1*	1*	0	0	0	0	1*	0	0	1	1	1	1	0	1*	1*
E15	1*	1*	1*	0	0	0	0	1*	0	0	1	1	1	0	1	1*	1*
E16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1*	1*
E17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

Table 14. Separation of influence and dependence strengths

Criteria	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12	E13	E14	E15	E16	E17
Influence power	4	3	2	17	7	11	13	6	8	7	7	8	14	10	10	2	1
Dependence power	13	14	15	1	2	4	3	12	4	2	9	7	2	6	6	13	17

In the next step, the output set, input set and common elements must be identified in order to determine the relationships between dimensions. for each variable, level determination score, priority of the variable, achievement set, and precondition set are specified. Achievement set for each variable includes variables which can be reached by the variable. Further, a precondition set of a variable includes variables which can help reach the variable. Then, the commons of achievement and precondition set of all factors are

specified and in case the achievement and common sets are the same, that factor (or those factors) is(are) considered as priority level. The level refers to the designed layers of the final model. in order to reach other levels, the previous level(s) must be separated from the matrix and the process repeated. After determination of the levels, the acquired matrix must be set in levels order and the new matrix is called conical matrix. The input and output set for a variable is defined as follows: an output set for a particular dimension/element is the very variable plus other variables which are affected by that variable, i.e. those variables which can be achieved by this variable. An input set for every variable includes that variable plus those variables which influence on that variable. Further, common elements refer to common dimensions of the output and input sets of variables in the interpretive and structural comprehensive model as high level variable. In other words, these variables do not affect creation of any other variable. After specifying the output, input and common elements, the dimension(s) which has (have) the same output and common elements are determined as the first level and the least effective dimensions of internal auditors quality. After determination of the least effective dimension of internal audit quality function, that dimension is eliminated and dimensions with same input and common elements are investigated, and that is selected as the next level. This is repeated until constituting elements of all levels are specified.

As it can be seen in Table 15, the dimension "approval of plan, budget and auditing reward" (E4) is determined as the most effective dimension of internal auditing quality functions improvement based on the common output dimension and equal elements. Moreover, the dimension "improvement of learning level in internal auditing functions via free circulation of information (E17)" was determined as the first and least effective dimension of internal audit quality function improvement in Tehran Stock Market companies.

Table 15. Output and input dimensions set and common elements of dimensions

Abbreviation	Output dimension	Input dimension	Common elements	Level
E1	1, 2, 3, 17	1, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	1	4th level
E2	2, 3, 17	1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	2	3rd level
E3	3, 17	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	3	2nd level
E4	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17	4	4	12th level
E5	1, 2, 3, 5, 8, 16, 17	4, 5	5	6th level
E6	1, 2, 3, 6, 8, 11, 12, 14, 15, 16, 17	4, 6, 7, 13	6	9th level
E7	1, 2, 3, 6, 7, 8, 9, 11, 12, 14, 15 ،16, 17	4, 7, 13	7	10th level
E8	1, 2, 3, 8, 16, 17	4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15,14	8	5th level
E9	1, 2, 3, 8, 9, 11, 16, 17	4, 7, 9, 13	9	7th level
E10	1, 2, 3, 8, 10, 16, 17	4, 10	10	6th level
E11	1, 2, 3, 8, 11, 16, 17	4, 6, 7, 9, 11, 12, 13, 14, 15	11	6th level
E12	1, 2, 3, 8, 11, 12, 16, 17	4, 6, 7, 12, 13, 14, 15	12	7th level
E13	1, 2, 3, 6, 7, 8, 9, 11, 12 14 ،15, 16, 17	4, 13	13	11th level
E14	1, 2, 3, 8, 11, 12, 14, 15, 16, 17	4, 6, 7, 13,14, 15	14, 15	8th level
E15	1, 2, 3, 8, 11, 12, 14, 15, 16, 17	4, 6, 7, 13,14, 15	14, 15	8th level
E16	16, 17	4, 5, 6, 7, 8, 9, 10, 11, 12, 13 15,14, 16	16	2nd level
E17	17	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17	17	1st level

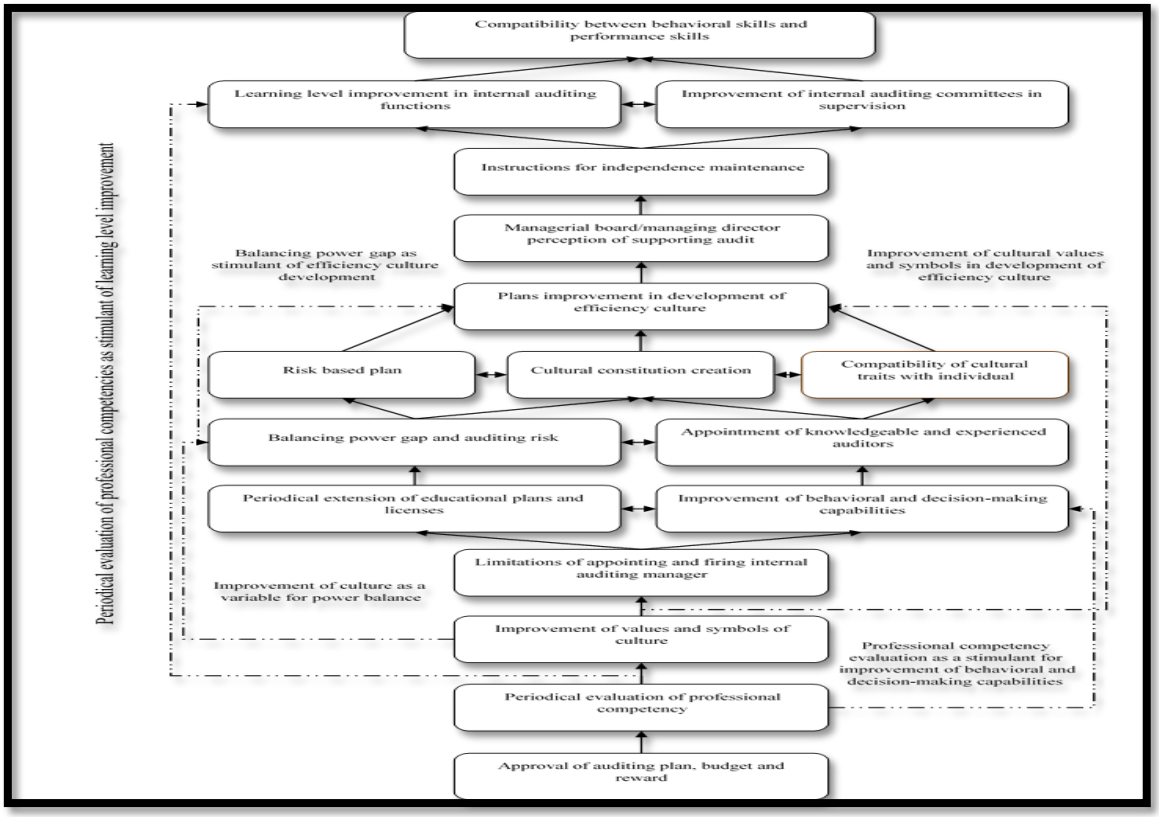

Figure 3. Internal auditing quality improvement factors model

6. Discussion and Conclusion

6.1. Analysis of the results in the qualitative section

The present research aimed to design a model for internal auditing quality based on constitution of Tehran Stock Exchange. The results and conclusion of the research come in the followings.

6.1.1. Leadership factors of internal auditing quality improvement

The word leadership in companies with board of managers refers to sovereignty supervisions on corporate performance. In fact, leadership factors are considered as supervision levels in performance in every system which tries to have effective level of plans implementation and strategies follow-up in several levels i.e. pre-implementation supervision,through-implementation supervision and post-implementation supervision. Therefore, leadership factors include a level of effective supervision on internal control according to effective evaluation of internal controls instruction passed in 2012 which embraces mechanisms to determine occupational upgrade criteria, creation of instructions in accordance with internal auditing constitution, and preparation of instructions regarding auditing independence maintenance in order to create some dynamism in improvement of internal auditing quality level as a competitive value, the outcomes of which include faster circulation of information feedback and increase of shareholders' decision-making power, representation costs reduction and company value increase. In other words, the leadership factors of internal auditing quality helps companies with improving transparency in financial and behavioral

performance by supervision and explore deviation from auditing standards. It should be noted that these factors can help increase internal auditing quality only when auditing committees have decision-making power independent of the influence of managerial board members and integrated instructions for internal auditors' professional behavior be present and managerial board helps increase internal auditors independence level in order to have dynamic reports and fill beneficiaries' expectations gaps. These findings are compatible with the results of studies conducted by Hajiha (2019), Rahimi et al.. (2016), Raja Ahmed et al.. (2019) and Jagi et al.. (2016).

6.1.2. Socio-cultural factors of internal auditing quality improvement

Socio-cultural factors are in content dimensions set of every organizational structure which include external and qualitative features affecting professional functions of job occupants. These factors set al..so affects internal audit profession especially when internal auditors perform under organizational structures supervision. In fact, socio-cultural factors refer to the link between corporate culture and internal audit profession culture which helps increase quality of corporate reports and disclosures. Moreover, presence of cultural dimensions results in increasing moral norms of internal audit profession. These values, however, will be possible by creation of a separating line between institutionalized powers of corporate structure and internal auditors risk evaluation because if auditing profession culture and social performance is ignored, the effectiveness of internal auditors in transparency improvement will be reduced. It should be noted that financial reporting process should be filtered by auditors, of course after passing accountants' filter, in order to improve transparency in internal control mechanism. Hence, presence of such socio-cultural values in a company will improve this role. Creation of a cultural constitution in internal auditing activities and matching socio-cultural values with professional dimensions is considered as a competitive advantage in sTable development of internal auditing effectiveness. This widens auditors' career and results in dynamism of corporate information disclosure performance and improves internal audit quality. These findings are compatible with the results of studies conducted by Hajiha (2019), Rahimi et al.. (2016), Raja Ahmed et al.. (2019), Jagi et al.. (2016).

6.1.3. Process and individual training factors of internal auditing quality improvement

Individual capabilities level improvement is an important factor in human resource strategies of every organization to improve productivity and effectiveness. In other words, training and individual performance effectiveness level increase will strengthen individual's motivations and add more dynamism to organizational structure. This is true also for internal auditing profession. Appointment is a human resource function in workforce selection stage and it must match the job description and if they are not compatible, the individual will be under pressure and face with conflicts and he or she will not have necessary efficiency for the job and information transparency and stock market performance will be damaged. Moreover, evaluation helps improve occupational performance in all levels. Regarding internal auditing, evaluation is of great importance because it helps increase assurance of disclosed reports contents and improves trust in stock market. Evaluation process within an organization is useful and successful when the company is mature enough to understand the importance and it is not regarded purely as a criterion for documentation and disclosure of more attractive reports. Periodical evaluations effectiveness can give more creative and effective mentality to an individual by extension of or introduction of new courses, because the individual understands the attention of the company and cares about corporate values and norms and this in part improves his or her behavioral and decision-making capabilities. Finally, learning as an effective function is a process in internal auditing profession which helps an auditor grow by combining the experiences with new knowledge. This finding is compatible with the results of studies conducted by Hajiha (2019), Rahimi et al.. (2016), Raja Ahmad et al.. (2019), and Jagi et al.. (2016).

6.2. Analysis of the results of quantitative section

6.2.1. Analytical argument of leadership factors of internal audit quality improvement

Based on the structural interpretive analyses, the leadership factors of internal audit quality were specified. 10 dimensions were verified in this regard within the framework of a 6-level model. in the least effective level, two dimensions: instructions with internal auditors independence maintenance approach and managerial board perception of internal audit support were present and in the sixth level, i.e. the least effective level, approval of internal audit program, budget and reward was present.

It should be noted that approval of a reward for internal auditors is a motivational human resource factor in corporate macro level. Hence, managerial board members and managing directors of companies can give reward to the internal auditors and thereby improve their motivations and receive higher levels of financial transparency and increase social trust. Moreover, creation of dynamism in internal auditing committees can help improve auditors' independence and increase transparency of functional reports which are given to the auditors and this can help them make better judgments and decisions. Further, the results showed that compatibility of a company's constitution with internal audit behavior norm can help improve internal audit qualitative functions. Therefore, the managerial board and instructions of the company should be directed at improvement of transparency in order to be successful in stock market and reduce the gap between disclosed reports and audit comments. In the fourth level, i.e. the third effective level from the bottom, we have determination of criteria for internal auditors' occupational upgrade. This in part can increase individual motivations and pave the way for auditors' careers progress and boost their accountability and responsiveness. Moreover, risk-based plans including sovereignty strategy approaches can result in increasing effective and professional performance in financial reporting. In the first level, i.e. the least effective dimension, we have compatibility of managerial board and managing director's perception of internal auditing support and statements about internal auditing independence. Although they are important, they were not so noticeable in the 10-item spectrum of dimensions identified. This might be attributed to adherence of companies to professional independence of auditors and their support of the internal auditing by legal requirements. These findings are compatible with the results of studies conducted by Hajiha (2019), Rahimi et al.. (2016), Raja Ahmad et al.. (2019), and Jagi et al.. (2016).

6.2.2. Analytical argument of socio-cultural factors of internal auditing quality improvement

6 levels of dimensions from the least to the most effective were identified by analyses. The least effective dimensions included development of moral norms of internal auditors' profession (C2) and balancing of internal auditing risk power (C5) and the most effective dimension was improvement of auditing culture values and symbols in company (B7).

It can be argued that improvement of auditing culture symbols and values in a company is the most effective dimension and can improve internal auditing quality functions. It is an important criterion and companies should develop values compatible with auditing targets and standards and thereby help values be institutionalized in all performance, behavioral and responsiveness levels of a company and deviations are reduced in financial disclosures. These values show the path of development of internal audit profession within the framework of symbols of exactness, explanation and subtleness in stock market level evaluations. Moreover, the results revealed that development of educational programs can improve internal auditors' professional knowledge and develop efficiency of internal auditors' culture. Improvement of knowledge of the internal auditors can improve auditors' commitment, responsiveness and independence as cultural symbols and value-adding items. Further, the results showed that in the fourth level, i.e. improvement of adherence to moral constitution should be cared about by not only the auditors but also by company pillars and therefore the interactions between the company and auditors are clarified and expectations be directed mutually based on moral procedures. This helps prevent beneficiaries' rights violation and improve financial reporting transparency. Finally, the results showed that the two dimensions: development of professional moral norms development and balancing power gap in internal auditing were of less importance from professionals'

viewpoints. The reason for this may be the technical dimension of internal auditors' performance functions and that norm-making and regulation of power gap must receive attention by supervision entities. These findings are compatible with the results of studies conducted by Hajiha (2019), Rahimi et al.. (2016), Raja Ahmed et al.. (2019) and Jagi et al.. (2016).

6.2.3. Analytical argument of process factors and individual training of internal audit quality improvement

6 levels of dimensions, from the least to most effective ones were identified from the analysis matrix. The least effective dimensions included periodical evaluation of professional qualification of internal auditors (D2), periodical extension of educational plans and internal auditors licenses (D3) and improvement of learning level in internal auditing functions via information (D6) and the most effective dimension was improvement of behavioral capabilities and decision-making of internal auditors via training (D4).

It can be argued that development of decision-making skills and capabilities is an important human resource management tool which seeks jobs professional development. In internal auditing profession, the supervision entities try to improve individual capabilities via educational requirements and this in part helps improve internal auditing quality. Educational programs should match individual needs of auditors and appointments should be based on compatibility of individual behavioral characters. When appointment of internal auditors is based on a combination of expertise and experience, the improvement of effectiveness of auditing will be more accessible. In the first level, the results showed that the professional competency of the internal auditors must be evaluated apart from their qualification. Moreover, educational courses must be planned periodically to improve the auditors' knowledge of their profession and their decision-making power and problem-solving capabilities. These results are compatible with the findings of studies conducted by Hajiha (2019), Rahimi et al.. (2016), Raja Ahmed et al.. (2019) and Jagi et al.. (2016).

7. Recommendations

1) As the leadership factors of internal auditing quality improvement were specified by the structural interpretive analysis, approval of a plan, budget, and reward for auditors must be considered. Therefore, it is recommended that managerial boards allocate rewards for auditors' based on their performance in order to improve competitiveness among them and increase their motivations, of course by respecting their independence. Further, consideration of a budget for internal auditing can help improve corporate competitive advantage. Moreover, setting an integrated plan of strategies can improve macro-level corporate performance because trust in company improves as representation costs gap with independent auditors' are decreased.
2) as the results of analyses of socio-cultural factors of internal auditing quality improvement revealed, the improvement of auditing culture symbols and values must be considered as an important feature. Therefore, it is recommended that the values and symbols of this profession be institutionalized within the corporate structures via development of cultural plans and auditors be turned into symbols of supervision on financial performance of companies and their access to information be free. In entity-level supervisions, it is recommended that the related organizations ask companies to define internal auditing profession thoroughly and improve transparency culture in companies and thereby reduce contradictions between internal auditors and independent auditors.
3) as the results of analyses specified the process factors and individual training factors of internal auditing quality improvement, improvement of behavioral capabilities and decision-making of internal auditors via training and education must be noticed. Therefore, it is recommended that educational processes of internal auditors must be planned based on comprehensive educational programs and be compatible with stock market changes and regulations. Further, the education should match the individual qualification and needs of auditors. This can help reduce role conflicts

and possible frustrations. Occupational conflicts and work-family conflicts may lead to social and professional life problems for individuals. Therefore, educational plans should be considered effectively by measuring individual needs and train more competent and capable auditors to help them follow their functions.

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