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The effectiveness of audit firm rotation on audit quality in companies listed on the Tehran Stock Exchange using Pearson's linear torque model

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Abstract

The purpose of this research is to investigate the effectiveness of audit firm rotation on audit quality in companies listed on the Tehran Stock Exchange using Pearson's linear torque model. In order to achieve the purpose of the study, using the method of screening or systematic removal of the number of 90 companies admitted to the Tehran Stock Exchange, during the period of 2016 to 2021, selection and panel or combined data related to 630 companies-years from the database of the organization The stock market and securities were collected. This research is categorized as descriptive-correlation research in terms of its practical purpose, and historical or post-event-field research in terms of time. The results of the statistical analysis show that there is a direct relationship between the mandatory rotation of auditors and audit quality. In addition, the study shows that the companies that have changed their external auditors during the research period have a higher average "audit quality" and a lower dispersion coefficient of "audit quality" compared to the competing group or companies subject to the retention of independent auditors. They were. The conducted research showed that the coefficient of variance of the "audit quality" factor was higher for the business owners whose independent auditors were subject to mandatory rotation compared to their competitor group or the business owners whose independent auditors were not subject to mandatory rotation.

Keywords: Audit firm rotation, Audit quality, Independent auditor, Financial leverage, Pearson's linear torque model
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1 Introduction

In today's competitive world, job rotation in any professional activity, especially control and supervisory jobs, is the best alternative to find replacement and valuable employees quickly and from within the organization. Finding and promoting people to take on more important responsibilities is difficult. Job rotation helps human resource managers of organizations and audit firms to find the most efficient and useful people to replace sensitive jobs inside or outside the organization. If the job rotation process of employees and independent auditors is properly planned and implemented, surely, the decision-making elements of organizations and auditing institutions will improve the efficiency and effectiveness of the financial reporting system of companies, reducing environmental risks caused by the

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possibility of collusion. Auditors with owners, increasing the independence and impartiality of auditors will double help. Legislators and compilers of auditing standards have always tried to formulate laws to improve the independence of auditors and the quality of auditing. For example, the Sarbanes-Oxley law (2002) [1], which requires audit firms to change their partners and managers after every five consecutive years of audit work on an employer [7]. The literature of audit change or rotation has studied the effect of audit tenure on audit quality, which is emphasized by most of the previous researches. Although recent studies have examined auditor turnover, there have been limited attempts to compare voluntary and mandatory turnover in firms. Considering the position and role of audit institutions in users' decisions, the real independence of auditors and the quality of work of audit institutions are considered as key factors in preparing audit reports. For this reason, in order to increase the quality of work and maintain the independence of audit institutions, various solutions have been presented by professional authorities and experts in this profession, one of their recommended suggestions is the regular rotation of audit institutions. In recent years, the phenomenon of the rotation of audit institutions has become an important field in research and professional discussions in most countries. In these countries, certain working groups have been formed to study this issue in order to examine the effect of using this process from different aspects.

The long-term presence of the independent auditor next to the employer creates a tendency to maintain and respect the opinion of the employer's management, a situation that undermines his independence and impartiality. Aschauer et al. [2] showed that the existing laws lead to the separation of auditors from clients and are not effective on clients' understanding of professional skepticism. Knechel et al. [12] found that there is a relationship between professional skepticism of independent auditors and audit quality. They also found that there is a relationship between doubt and the performance of the head of the audit group in different companies. Brasel et al. [3] found that auditors were more skeptical in their judgments when reviewing and reassessing fraud risk. On the other hand, audit quality is the possibility of not providing an acceptable opinion for those financial statements that have significant distortions or errors. The American Association of Accountants, in the statement of the fundamental concepts of auditing published in 1973, defined audit quality as the auditor's ability to control the quality of information resulting from the process of matching financial statements with accepted accounting principles [1]. The audit report, as the final product of the audit process, has the nature of a product, the use of which does not prevent the use of other public services, and its use is not exclusive to any consumer. If audit is a monitoring tool that assumes the aforementioned multiple roles, then assuming other conditions are constant, high-quality audited financial statements will have more reliability and trust among the consumers of this product. In this research, an attempt has been made to investigate the effect of applying the mandatory change and mandatory rotation of auditing firms as one of the practical and executive strategies to solve the auditor's independence issue, and its effect on the audit quality of companies admitted to the Tehran Stock Exchange.

2 Theoretical foundations

The existence of transparent and reliable financial information is one of the main factors for evaluating the current situation and performance of a company in its activities, as well as making decisions about the trading of that company's securities. In today's economic environment, with the presence of diverse economic actors and the complex structure of economic relations between them, information that has been monitored and commented on by a professional and independent group is considered reliable [8]. A clear example of independent professional groups are auditing institutions, which mainly examine and monitor the reporting unit's internal control structure and its final product, i.e. financial statements, and comment on this matter. Obviously, considering the position and role of audit institutions in the decisions of users, the existence and emergence of auditor independence and improving the quality of work of audit institutions are considered as key factors in the preparation of audit reports [6]. For this reason, in order to increase the quality of work and maintain the independence of audit institutions, various solutions have been presented by professional authorities and professional experts, and one of their recommended suggestions is the periodic change of audit institutions [5].

[1] The Sarbanes–Oxley Act of 2002 is a United States federal law that mandates certain practices in financial record keeping and reporting for corporations. The act, (enacted July 30, 2002), also known as the "Public Company Accounting Reform and Investor Protection Act" (in the Senate) and "Corporate and Auditing Accountability, Responsibility, and Transparency Act" (in the House) and more commonly called Sarbanes–Oxley, SOX or Sarbox, contains eleven sections that place requirements on all U.S. public company boards of directors and management and public accounting firms. A number of provisions of the Act also apply to privately held companies, such as the willful destruction of evidence to impede a federal investigation. The law was enacted as a reaction to a number of major corporate and accounting scandals, including Enron and WorldCom. The sections of the bill cover responsibilities of a public corporation's board of directors, add criminal penalties for certain misconduct, and require the Securities and Exchange Commission to create regulations to define how public corporations are to comply with the law.

The separation of ownership and management in joint-stock companies due to the asymmetry of information caused by the structure of economic activity in large joint-stock companies and the possible conflict of interests between managers and owners requires reports prepared by management by independent persons in order to reduce agency costs. and be audited with competence. In this case, the requirement of audit institutions to periodically change their employers was considered as a solution to improve the independence of auditors [14]. Because many people, especially legislators, believed that the long-term relationship between the auditor and the employer reduces the auditor's supervisory power and also the quality of the audit. Following these events, legislators and compilers of accounting standards tried to formulate laws to improve auditors' independence and audit quality [13]. In the meantime, the supporters of the mandatory change of auditors are of the opinion that auditors, after being with an employer for a long time due to economic dependencies, will have more motivation to keep the employer and accept his views and demands, which distorts their independence. he does. They believe that long tenure creates a series of emotional relationships to the extent that it creates a sense of loyalty in auditors, thus compromising their independence. [11] Opponents of mandatory change may agree with this view, but they believe that the costs of implementing and applying this law outweigh its benefits. On the other hand, they argue that there are other factors such as the need to maintain credibility and reputation and the fear of filing lawsuits against them that compel auditors to maintain independence [10].

However, it is important that auditing standards be given special attention as one of the effective components on audit quality and as the only factor recognized by professional associations and authorities. Although other factors include users' understanding, knowledge and perceptions, auditors' skills and competence, regulatory and environmental measures and regulations are known as other factors and as other effective actors in the quality of audit services. [9] Since audit texts are constantly evolving, there is a need to keep them in line with the changes in the business environment, financial reporting standards and regulations, and technology, which is inherently one of the elements of the audit process and is always evolving [8]. And it is change and it evolves over time, it is necessary because otherwise and in case of lack of adaptability and homogenization with changes, it is not possible to achieve audit quality, and this means that improvement in every element Auditing quality elements should not prevent further efforts to improve other quality elements. On the other hand, different stakeholders most likely have different views on audit quality and how they try to achieve different quality[4]. The board of international auditing standards believes that what is important is to try to reach a common vision through the group of stakeholders including suppliers, investors, regulators, auditors and other groups opposed to policy makers. The government and other standard organizations should gather their views by sharing their views and understand and comment on the views of others.

Hypotheses

1. The rotation of independent auditors affects the audit quality of companies listed in the Tehran Stock Exchange.
2. There is a significant difference between the audit quality of employers who have changed their audit firm and the audit quality of employers who have not changed their independent auditors.

3 Linear models suitable for research propositions

According to the nature of the hypothesis and the implicit desire in it to test the existence and direction of the relationship between the response variable and the independent and control variables of the estimator, the statistical models of the first hypothesis of the research are as follows [3]:

$$AUDq_{jt} = \beta_1 + \beta_1 AUDR_{jt} + \beta_2 AGE_{jt} + \beta_3 SIZE_{jt} + \beta_4 LRGE_{jt} + \beta_5 Ret_{jt} + \beta_6 GSRR_{jt} + \beta_7 MSR_{jt} + \epsilon_{jt}.$$

The test of this proposition includes the evaluation of the relationship between each independent component of the rotation of independent auditors, company size, company life, company financial leverage, company sales growth rate, share return rate, and market competitiveness index as control estimators with the dependent variable. Audit quality can be explained through the design and modeling of Pearson moment regression linear relationship. In this regard, in order to determine the direction of the relationship and the intensity of the relationship, the predictive power of the model, the predictive accuracy of the model, and the significance of the coefficients of the model of the relationship between the components of working capital with each of the estimators from the statistics of the moment correlation coefficient (r_{ij}) of the moment coefficient , detection ($\overline{R}^2_{jt}$) of analysis of variance (F-test) is calculated. If, according to the moment correlation coefficient matrix, the quantity value calculated for the coefficients related to the hypothesis is significant in the 95% confidence interval, there is no reason for not accepting the hypothesis, so the

claim hypothesis or (H_1) is accepted and the opposite will also be true and the hypothesis Against or (H_0) accepted, the predictive power of the model for the hypothesis of the linear correlation coefficient matrix and the significance test of each coefficient will be based on the following test statistic:

$$Z_c \equiv t_c = [\psi - \psi_0] : Sqrt[(1-\psi_0^2) : (n-2)] \Rightarrow E[(Xi - \mu X) : \sigma X][(Yi - \mu Y) : \sigma Y]$$
$$H_0 : \psi^2 \equiv \psi_0^2 = 0 \rightarrow H_0 : Ad_j - Sq(R) \equiv E[(Xi - \mu X) : \sigma X][(Yi - \mu Y) : \sigma Y] \rightarrow \psi_0^2 = 0$$
$$H_1 : \psi^2 \equiv \psi_0^2 \neq 0 \rightarrow H_0 : Ad_j - Sq(R) \equiv E[(Xi - \mu X) : \sigma X][(Yi - \mu Y) : \sigma Y] \rightarrow \psi_0^2 \neq 0.$$

According to the nature and concept of the second research proposal, for the significance test of the difference between the abnormal accrual items of working capital, as a standard for measuring the quality of the audit of business units, from the test of the average difference of two independent societies for the samples that are subject to a change of independent auditor in the research period. and have been (experimental group) and also the samples that were subject to the change of the independent auditor during the research period and were not (control group or evidence) are used as follows:

$$H_0 : \mu_1 = \mu_2 \ V.S. \ H_A : \mu_1 \neq \mu_2.$$

Considering the type of hypothesizing of the second research proposal, the criterion of t-Criteria or T-Test is used to test the equality of the average of two independent populations $(\mu_1 - \mu_2)$:

$$t_{\frac{\alpha}{2},n_1-1,n_2-1} = \frac{(\hat{\mu}_1 - \hat{\mu}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{\hat{\sigma}_1^2(n_1-1) + \hat{\sigma}_2^2(n_2-1)}{n_1+n_2-2}(\frac{1}{n_1} + \frac{1}{n_2})}}.$$

According to the above model, if the value of the computational t_c test criterion is less than $t_{\frac{1}{2}\alpha,n-1}$ or greater than $t_{(1-\frac{1}{2}\alpha),n-1}$ assumption H_1 based on the inequality of the average audit quality in the two groups of subjects subject to and not subject to the forced change of independent auditors $(\mu_1 - \mu_2 \neq 0)$ is accepted, but if the criterion value of the computational tc test is greater than $t_{\frac{1}{2}\alpha,n-1}$ or smaller than $t_{(1-\frac{1}{2}\alpha),n-1}$, the assumption H_0 based on the equality of the average audit quality in the two groups of included subjects and Not subject to the forced change of independent auditors $(\mu_1 - \mu_2 = 0)$ is accepted. It should be noted that before the test of equality of the average audit quality in two groups of subjects subject to and not subject to the forced change of independent auditors, first the test of equality or homogeneity of variance $(\sigma_{21} - \sigma_{22} = 0)$ or inequality or heterogeneity of variance $(\sigma_{21} - \sigma_{22} \neq 0)$ audit quality variable in two groups of subjects subject to and not subject to the forced change of independent auditors using T-Test or F-Test Levene (The ratio of the variance of the subjects subject to and not subject to the forced change of independent auditors to the variance Subjects subject to and not subject to the forced change of independent auditors) or $F_c = \sigma_{21}/\sigma_{22}$ statistic is tested using the following criteria:

$$F_{Levena} = \frac{(N-t)\sum_{i=1}^{t} n_i(\overline{D}_i - \overline{D})^2}{(t-1)\sum_{i=1}^{t}\sum_{j=1}^{n_t}(D_{ij} - \overline{D_i})^2}$$
$$t_c = \frac{(s_1^2 - s_2^2)\ \sqrt{(N-2)}}{2.s_1 s.2\sqrt{(1-\rho_{1,2}^2)}}.$$

According to the above pattern, if the criterion value of the computational tc test is Smaller than $t_{-}\frac{1}{2}\alpha, n-1$ or greater than $t_{(1-\frac{1}{2}\alpha),n-1}$ assumption H_1 is based on the inequality or heterogeneity of the audit quality variance in the two groups of subjects subject to and not subject to the forced change of independent auditors $(\mu_1 - \mu_2 \neq 0)$ accepted, but if the criterion value of the computational t_c test is greater than $t_{\frac{1}{2}\alpha,n-1}$ or smaller than $t_{(1-\frac{1}{2}\alpha),n-1}$ the assumption H_0 based on the similarity or equality of the average audit quality in two groups Subjects subject to and not subject to the forced change of independent auditors $(\sigma_{21} - \sigma_{22} \neq 0)$ accepted. If we want to check the above

rule by using the F-Test Levene test (the variance of the subjects included and not included in the forced change of independent auditors to the variance of the subjects included and not included in the forced change of independent auditors) or the statistic $F_c = \sigma_{21}/\sigma_{22}$, in the form of the expression "as the value of the criterion $F_c = \sigma_{21}/\sigma_{22}$ calculation test σ should be smaller than $F_{1/2\alpha,df1,df2}$ or greater than $F_{1-1/2\alpha,df1,df2}$ Hypothesis H_1 based on the inequality or heterogeneity of the audit quality variance ratio in two groups of subjects subject to and not subject to the forced change of independent auditors ($\sigma_{21}/\sigma_{22} \neq 0$) accepted, but if the criterion value of $F_c = \sigma_{21}/\sigma_{22}$ calculated greater than $F_{1/2\alpha,df1,df2}$ or smaller than $F_{1-1/2\alpha,df1,df2}$ assumption H_1 based on the equality or similarity of the audit quality variance ratio in two The group of subjects included and not included in the forced change of independent auditors ($\sigma_{21}/\sigma_{22} = 0$) is accepted, changes.

4 Method

This research is in the field of financial proof research. Due to the fact that the historical information of the companies has been used to test its hypotheses, it is placed in the quasi-experimental research group. According to the nature and method used in this research, it is a descriptive-correlational research. The present research is based on an empirical epistemology, its reasoning system is inductive, and in terms of the type of study, it is field-archival. The statistical population of the research consists of companies admitted to the Tehran Stock Exchange. Sampling method is systematic exclusion or screening method. In this research, in order to analyze and interpret data, Statistical Processing for Social Science software will be used to process information.

5 findings

5.1 Testing the linear torque model of the first hypothesis

The result of testing the linear torque model of the first hypothesis, using the fixed effects method and the generalized least squares estimation method, is presented in Table No. 1. It is worth mentioning that for the hypothesis test, in order to check the internal validity and external validity of linear models, estimation of significance tests of unstandardized and standard beta coefficient at 95% confidence level, estimation of standard deviation of estimation of beta coefficients $Std(\beta)$, comparison of critical value of t statistic with The value of $t_c = \beta_j/SE(\beta_j)$ calculated in the output of the statistical software, comparing the critical value of the F statistic with the value of Fisher's calculated statistic (intergroup mean square to mean square error) or $F_{df1,df2} = MSR/MSE$, "Critical values of T " and the probability values or significance level of the test criteria t and F or $P_r(|tc| > t_{\frac{1}{2}\alpha,df})$ and $P_r(|Fc| > F_{\frac{1}{2}\alpha,df_1,df_2})$, "status index" or "condition index (CI)" and the "Camera-Watson (dw)" statistic is used:

$$MSR_{jt} + jtGSRR_{jt} + \beta RET_{jt} + \beta LEVERAGE_{jt} + \beta SIZE_{jt} + \beta AGE_{jt} + \beta AUDR_{jt} + \beta + \beta AUDq_{jt} = \beta.$$

According to the information summarized in the above picture, the following analyzes are presented for the linear model of the first hypothesis:

5.2 Evaluation test of the overall validity of the linear torque model

As can be seen in the above table, based on the values of regression sum of squares, residual error sum of squares, mean of regression sum of squares, mean of sum of squares of residual error, with degrees of freedom (7) and (622), the calculated value of Fisher's statistic ($F_c = MSR)/MSE$), the critical values of the test criterion (Critical Values) include ($F_{df1,Fdf2,\frac{1}{2}\alpha}$), ($F_{df1,Fdf2,\frac{1}{2}\alpha}$) and the probability value of Fisher's statistic in the 95% confidence interval, for testing the following hypothesis as follows Is:

$H_0 : \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = \beta_8 = 0$

$H_A : \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = \beta_8 \neq 0$

$SSR = 932/140, SSE = 202/3126, DF_1 = 7, DF_2 = 622, MSR = 163,133, MSE = 5,025$

$FC = MSR/MSE = 495,26, P_r(Fc = 495,26) = 000/0F(622,7), 025,0 = 241164,0F(622,7), 975,0 = 2,29532.$

Based on the statistical output, it is interpreted as such, since the probability value of the computational test criterion (Fc=MSR/MSE) is outside the range of $F(7,622), 0,025 < F_c < F(7,622), 0,975$ or The calculated F_c probability value is smaller than the 5% error, so:

Table 1: Hypothesis test of the moment linear regression model based on the first hypothesis

Estimator variables	UNSTANDARD		Z(BETA)	T-TEST	SIG	IC-%95		Co-Linearity	
	BETA	SE[BETA]				L_{LOW}	L_{HIGH}	VIF/1	VIF
Width from the origin of the linear model	13/675	0%1/114	-------	12/268	0/000	11/485	15/866	-------	-------
Audit firm rotation	2/470	0%813	1/333	3/035	0/025	-1/350	3/362	0/969	1/030
Common stock rate of return	-1/991	0%969	-0%860	-2/070	0/028	-2/550	0/511	0/840	1/189
Sales revenue growth rate	1/166	0%428	0%988	2/720	0/025	-0/255	1/250	0/995	1/004
Financial leverage in capital structure	-1/978	0%769	-0%988	-2/570	0/001	-3/510	0/549	0/842	1/187
Competitiveness index	0/910	0%479	0%468	2/230	0/025	-0/590	1/368	0/715	1/398
Subject size	-1/193	0%398	-0%758	-12/700	0/000	-1/390	1/922	0/950	1/052
Life of the subject	1/293	0%116	0%555	11/062	0/000	-1/065	1/525	0/910	1/099
Correlation coefficient between the overinvestment variable and the determining criteria							R_{ij}=%77,90		
The coefficient of determination between the overinvestment variable and the determining criteria							R^2_{ij}=%60,70		
The coefficient of determination between the overinvestment variable and the determining criteria							$\acute{R}^2_{ij}$=%57,40		
The standard deviation of the prediction error of the linear torque model (the degree of accuracy of the linear model(							SEE(FULL MODEL)=1,596		
Durbin-Watson statistic - determining the autocorrelation (serial correlation) between the residual error of the linear model							D_W=1/890		
Fisher's statistic (F) and the probability value of Fisher's statistic in the 95% confidence interval - general validity test of the linear model							F_C=26/490 Pv (F_c)=0/000		
The autocorrelation statistic between the estimator variables - the status index statistic and the value of the eigenvalues of the model							CI_{Max}=10/555 λ_{Max}=4/345		
Latent roots values or eigenvalue values for the correlation coefficient matrix, including the maximum and minimum eigenvalues and other eigenvalue values between the minimum and optimal latent roots resulting from linear combinations of the equations corresponding to the estimator variables using the principal component analysis technique							CI_{Min}=1/000 λ_{Min}=4/345 CI_2=10/560 λ2=1/790, λ3=1,001		
Principal Components Analysis(PCA)							CI_3=2/085 λ4=0/470,		
							CI_4=3/051 λ5=0/312,		
							CI_5=3/370 λ6=0/084		
							CI_6=7/185 λ7=0/05		

(A) Assuming the existence of a linear relationship between the estimator variables "compulsory rotation of independent auditors", "common stock return rate", "degree of financial leverage in the capital structure", competitiveness concentration index", "growth rate of sales income and other operating incomes" "Company size" and "Company life", with the dependent variable "auditing quality of the employer's unit", are confirmed at the 95% confidence level;

(B) Coefficients of the variables "compulsory rotation of independent auditors", "common stock return rate", "degree of financial leverage in the capital structure", "competitiveness concentration index", "growth rate of sales income and other operating income" "company size" and "company life" have a significant difference compared to zero, so the hypothesis H_0 is not confirmed and

(C) the estimator variables explain the variance of the variable as well as the changes of the dependent variable "audit quality of the employer's unit", so the overall validity or internal validity of the linear model It can be confirmed.

6 Testing the fitting power of the linear torque model

The value of detection coefficient r^2_{ij} and adjusted detection coefficient r^2_{ij} in terms of independent and control variables shows that about 61% of the variance and 57% of the average variance of the dependent variable "audit quality of the employer's unit" by the estimator variables "compulsory rotation of independent auditors", "stock return rate" Normal", "Degree of financial leverage in capital structure", "Competitiveness concentration index", "Growth rate of sales revenue and other operating income", "Company size" and "Company life", explained with the dependent variable "Employer unit audit quality" will be Also, the standard deviation of the prediction error of the

linear model or the degree of accuracy of the linear model, with the value:

$$SSE(FULLModel) = S_{est} = \sigma_{AUDq}.\sqrt{[1 - r_{ij}^2).(N : N - 2)]}$$
$$SSE(FULLModel) = S_{est} = \sqrt{[1 - r_{ij}^2).SSE(AUDq) : (N - 2)]}$$
$$SSE(FULLModel) = S_{est} = (2,540)\sqrt{[(1 - 0,607).(630 : 628)]} = 1.595$$

It shows that the error of the linear model in predicting the dependent variable "audit quality of the employer's unit" is at a low level. The probability value or the significance level of the T-Test criterion for the coefficients of the estimator variables "compulsory rotation of independent auditors", "common stock return rate", "degree of financial leverage in the capital structure", "competitiveness concentration index", "sales revenue growth rate" and Other operating incomes, "company size" and "company life" show that the said variables with the final effects and test criteria, along with the value of the following possibilities:

$H_{.} : \beta_j = .V.S.\ HA : \beta_j \neq .$
$\beta_1 = 334,1, \beta_2 = -860,0, \beta_3 = 988,0, \beta_4 = -987,0, \beta_5 = 468,0, \beta_6 = -759,0, \beta_7 = 0,556$
$\beta_1/SE(\beta_1) = 3,036, \beta_2/SE(\beta_2) = -2,071, \beta_3/SE(\beta_3) = 2,720, \beta_4/SE(\beta_4) = -2,571, \beta_5/SE(\beta_5) = 231,2,$
$\beta_6/SE(\beta_6) = -702,12, \beta_7/SE(\beta_7) = 11,064$
$P_r(t_1 = 3,036) = 0,025, P_r(t_2 = -2,071) = 0,029, P_r(t_3 = 2,720) = 0,026, P_r(t_4 = -2,571) = 0,001,$
$P_r(t_5 = 231,2) = 0,026, P_r(t_6 = 702,12) = 000,0, P_r(t_7 = 064,11) = 0,000$

respectively, positive, negative, positive, negative, positive, negative and positive effect on the response variable "audit quality of the employer" and also the aforementioned coefficients are significant at the 95% confidence level, because the value of the probability value or the significance level of the criterion value of the test (t), for all estimator variables is less than five percent error, or the criterion value of the computational test is outside the range of $t(628), 025, 0 < t_c < t(628), 975, 0$. Therefore, the assumption of H_A is confirmed for all the coefficients, and including them in the linear model leads to an increase in the usefulness and predictive power of the model.

7 Colinearity and autocorrelation test of the residual error of the linear torque model

To determine the degree of collinearity or multiple collinearity between the estimator variables as well as the sequential autocorrelation between the residual errors of the linear model estimation, Durbin-Watson statistics and compatibility index or status index are also used. Status index from the relationship of the ratio of the largest eigenvalue of the equation ($\lambda_{Max} = 4,344$) of the linear combination of the independent variables to the root minimum for the ith variable or ($\lambda_i = 039$) or eigenvalue with the statistical relationship CIAVG= $\sqrt{[\lambda_{Max} = 4,344 : \lambda_{Min}, i = 0,39]} = 1,554$ is calculated. If the value of the condition index is less than 10, weak collinearity, if the condition index is between 10 and 30, significant collinearity and if the index is greater than 30 Therefore, the collinearity will be gross. According to the values of the hidden roots (λ_i) calculated for the correlation coefficient matrix - using the principal component analysis technique - the estimator variables, the average condition index for the model is equal to 554.10, so the problem of collinearity or multiple collinearity between the estimators of the linear model is excluded. In this regard, the collinearity test for all linear combinations of the estimator variables is as follows:

$$CI_{max} = \sqrt{[\lambda_{Max} = 4,344 : \lambda_{Min}, i = 0,039]} = 10,554$$
$$CI_{min} = \sqrt{[\lambda_{Max} = 344,4 : \lambda_{Min}, i = 0,039]} = 1$$
$$CI_1 = \sqrt{[\lambda_{Max} = 4,344 : \lambda_{Min}, 2 = 1,788]} = 1,559$$
$$CI_2 = \sqrt{[\lambda_{Max} = 344,4 : \lambda_{Min}, 3 = 001,1]} = 2,083$$
$$CI_3 = \sqrt{[\lambda_{Max} = 344,4 : \lambda_{Min}, 4 = 467,0]} = 051,3$$
$$CI_4 = \sqrt{[\lambda_{Max} = 344,4 : \lambda_{Min}, 5 = 312,0]} = 732,3$$
$$CI_5 = \sqrt{[\lambda_{Max} = 344,4 : \lambda_{Min}, 6 = 084,0]} = 184,7$$
$$CI_6 = \sqrt{[\lambda_{Max} = 344,4 : \lambda_{Min}, i = 058,0]} = 654,8$$

In addition, because the criterion value of Atson's camera DW=1.89 is between 1.5 and 2.5, the serial autocorrelation between the residual error of the linear model was ruled out and the error sentences are independent of

each other. In other words, the covariance coefficient between error sentences is equal to zero and the relationship $Cov(e_i, e_j) = 0 | i \neq j$ is true.

Considering all the points, based on the probability value of the F-test and T-test criteria and the computational detection coefficient, the usefulness of the linear model in the first hypothesis to explain the variance of the dependent variable "audit quality of the employer's unit" by the estimator variables due to non-collinearity and autocorrelation. The sequence between the residual terms is confirmed at the 9% confidence level and there is no reason not to reject the opposite hypothesis (the negative hypothesis of the claim or H_0).

8 The test of equality of mean and variance of two independent societies in the analysis of the second hypothesis

The purpose of this test is to compare the averages of two independent groups in the society, and the assumption of this test is the normality of the distribution of statistical attributes in two independent groups. Before performing the two-comprehensive mean difference test or the mean equality test in two independent groups from the society, the homogeneity or equality of variance test in two independent groups from the society using Levene's F-Test statistic or T-Test statistic) should be checked first. If the probability value obtained for the test of equality of variance of two independent groups is greater than 5%, the null hypothesis (H_0) based on $H_0 : \sigma_1 = \sigma_2$ is accepted, otherwise the research hypothesis (H_1) or $H1 : \sigma_1 \neq \sigma_2$ It is confirmed that this rule applies to the test of the difference of the mean of two independent groups or the test of the equality of the mean in two independent groups of the society or $H_0 : \mu 1 = \mu 2, H1 : \mu 1 \neq \mu 2$.

9 Test of homogeneity and (equality) of variance in two independent societies

In this regard, the test of the assumption of equality of variance of the variable "audit quality of the employer unit" in two groups of employers who changed their independent auditors during the research period, including 310 companies-fiscal year and "owners who changed auditors during the research period" have not changed independently" including 320 companies-fiscal year, including the results of statistical software, as follows in Table 2:

Table 2: Equality of variance test of "audit quality of the employer unit" in the treatments subject to change and no change of independent auditors

Auditor quality	N_i	Homogeneity of variance	SD (AUDR)	SE (AUDR)	Leven's Test for Equity of Variance		The correlation coefficient
					P_r-Value	F_{Levene}	
AUDR=1	310	equality	0,49232	0,02796	0.313	2,333	%18071
AUDR=0	320	Inequality	0,91615	0,05122			

According to the information in the above table, considering that the probability value of F Levene's test criterion is greater than 5% error, so there is evidence of acceptance of heterogeneity of variance between "audit quality of employer's unit" in two test groups "companies subject to change of independent auditors" and " "Companies subject to the retention of independent auditors" were not observed, so it can be concluded that at the 95% confidence level, the variance of "Employer unit audit quality" is the same (equal) in both groups of companies (accepting the null hypothesis). In other words, based on the T-Test statistic, it is possible to make a statistical judgment about the equality of variance in two groups as follows:

$$S_1^2 = 0,24238, S_2^2 = 0,83933, \rho_{12} = 0,1871, N = 630$$

$$T_c = (S_1^2 - S_2^2) Squart(N-2) / Squart[4S_1^2 S_2^2 (1 - \rho^2 12)]$$

$$t_c = \frac{(0.24238 - 0.83933)\ \sqrt{(628)}}{\sqrt{[4(0.24238)(0.83933)(1 - 0.1871^2)]}}$$

$$T_c = -1,49595 : 0,8861 = -1,68824, t_0, 025, 628 = -1,96, t_0, 975, 628 = +1,96, Pv = 0,0681.$$

According to the critical values of t, since the calculated value of tc is in the range of ±1.96, or the probability value (significance level) of the test criterion is greater than 5%, so there is no evidence to accept the hypothesis H_1 and it can be He concluded that at the 95% confidence level, the null hypothesis ($H_0 : \sigma_1 = \sigma_2$) is accepted (equal variance of the two groups).

10 Test of homogeneity (equality) of mean in two independent societies

The test of the equality of the mean of the variable "audit quality of the employer's unit" in two groups "owners who changed their independent auditors during the research period" including 310 companies-financial year and "owners who changed their independent auditors during the research period" have not changed" including 320 companies - financial year, including the results of statistical software, as follows in Table 3:

Table 3: Equality test of the average "audit quality of the employer's unit" in two groups subject to change and no change of independent auditors

Homogeneity of variance	T-Test for Equality of Means (μ_1-μ_2)				95% Confidence Interval of the Difference (μ_1-μ_2)	
	t-Student	P-Value	$D\mu^1$-μ^2	SE ($D\mu^1$-μ^2)	High Limite	Low Limite
Equality of variance	2,848	0,005	0,37335	0,131093	0,770105	0,023396
Inequality of variance	2,823	0,005	0,37335	0,131093	0,776256	0,029547

According to the critical values of t=±1.96, since the calculated value of tc is not in the range of ±1.96, or the probability value (significance level) of the test criterion is smaller than 5%, so there is evidence to reject the hypothesis. H1 does not exist and it can be concluded that at the 95% confidence level, there is no reason to accept the null hypothesis ($H_0 : \mu_1 - \mu_2($ (heterogeneity of the average audit quality in two groups of companies subject to and not subject to the transfer of independent auditors).

11 Conclusion

In this research, the factor of auditors' forced turnover on audit quality was investigated. The results of the statistical analysis show that there is a direct relationship between the mandatory rotation of auditors and audit quality, while almost 2/3 of the variance of the "audit quality" factor is explained by the "mandatory rotation of independent auditors" estimator (the results of this research are more consistent with The arguments of those in favor of forced rotation of independent auditors) and the rest of the variance of the response factor is explained by the estimators of the opposing group. In this analysis, factors such as the size of the employer's unit, the years that have passed since the employer's activity until now, the degree of financial leverage in the capital structure, the share gained from the product market in the industry and future investment opportunities also play an important role in explaining the fluctuations. They perform audit quality. In addition, the study shows that the companies that have changed their external auditors during the research period have a higher average "audit quality" and a lower dispersion coefficient of "audit quality" compared to the competing group or companies subject to the retention of independent auditors. They were. The conducted research showed that the coefficient of variance of the "audit quality" factor was higher for the business owners whose independent auditors were subject to mandatory rotation compared to their competitor group or the business owners whose independent auditors were not subject to mandatory rotation.

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