

Review Impact Diversification Audit Firm on Audit Quality

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Abstract: Companies with the aim of expanding income diversification do. Management strategy theory indicates that diversification may have either positive or negative effects on the quality of outcome reports. The aim of this research is to review the impact of diversity in audit companies on audit quality in companies listed in Tehran Stock Exchange. In this research, diversification and size of audit companies are considered as independent variables and audit quality as dependent variable. Companies listed in Tehran Stock Exchange comprise the research population. Through systematic screening method, a number of 181 listed companies in the 2007-2013 time span were selected and logistic regression model was used to test the hypotheses. The results indicate that there is a negative relationship between the diversification of an audit company and the audit quality. Other results indicated that the size of an audit company decreases the conflict between diversification of an audit company and the audit quality.

Key words: Diversification, audit quality, size of audit company, research, stock, exchange

INTRODUCTION

Business units in markets use diversification to increase sales, manage risks and maximize their profits. Strategic management theory shows that due to dimensional economics (savings resulting from size) and savings resulting from scale, market power, risk reduction and learning, diversification should have a positive impact on performance of business units (Geringer *et al.*, 2000). If less attention is paid to diversification and it is placed among its related domains (related diversification), it can have a positive impact on business unit performance, because different market and product domains can make use of the knowledge obtained from other domains (Rumelt, 1974).

If diversification gets too expanded (unrelated diversification), it may have negative impact on business unit performance due to the lack in savings resulting from developing dimensions of qualifications and competences (Palepu, 1985).

Broad researches (Francis *et al.*, 2013) indicated that bigger audit companies provide higher quality audits. In other words, audit quality is known as a function of the audit company size. Audit companies can be diversified in different ways. They can audit employers in different industries.

So, a question arises here: does diversity of an audit company affect the audit quality?

Literature review: The nature and role of an auditor concerning existing uncertainties about the quality of

reported information can be considered. An auditor as a pioneer has an investigative role in managerial claims that are mentioned in financial statements. Audit, particularly as a social mechanism, incorporates the observation of managers' behaviors and acts as a political tool for governments. An auditor can play such roles efficiently when detecting audit distortions as much as possible. In other words, the quality of the audit process should be high.

A broad complex of researches, for instance Francis *et al.* (2013) indicate that audit quality is different in different industries. So, confirming the relationship between audit quality and industry type results in audit enforcement in different industries.

The audit environment is very important due to the competitive pressure, fee issues and low growth rates, so audit companies should have continuous attempts to meet the employers expectations and maximize their expectations by increasing audit quality, if they want to compete in this environment successfully.

In the past, many attempts have been made to define "audit quality"; however, none of them have gained public acceptance. Davidson and Neu (1993) define audit quality as an auditors ability to detect and remove important distortions and perform manipulations in reported profit. So, an auditor's ability is an important issue in audit quality which is interpreted from different viewpoints and is broadly related to internal and external factors such as an auditor's features (experience, competence, ethics,) independency of auditors (independency from employer, competition in the market)

and legislation environment (mandatory replacement, auditory and non-auditory services). Considering the multi-dimensional features of audit quality, it is not specified which of the mentioned factors is effective in determining an auditor's ability, so it is not possible to observe and measure the audit quality directly.

Chen and Hsu (2009) extracted the audit quality from human capital (education, experience, certificates, training, attempts) to review if there is a positive relationship between audit size and audit quality and analyzed audit size in three levels (big, medium, small). They found that there is a positive relationship between audit size and audit quality in big organizations in comparison to small organizations, but this difference is not observed in medium-sized organizations in comparison to small organizations. They also found a positive relationship between audit quality and audit fee of big audit companies in comparison to small audit companies but this was not evident among medium and small audit companies. Anyway, their empirical evidence support audit size as a base for measuring audit quality, it indicates that big audit companies with high audit quality, have additional fees.

Lai (2009) reviewed the relationship between companies with high investment opportunities and high audit quality and reviewed that if this relationship may lead to low possibility for company profit management. A company with high investment opportunity may demand high audit quality to prevent profit management. On the other hand, an auditor of 5 big organizations make high audit quality due to the high risk of losing audit independency, which limits the profit management of companies with high investment opportunities. The results of their research indicated that companies with high investment opportunities have high motivations to use big audit companies (4 big) than companies with low investment opportunities; this relationship is low when their auditor is one of the big audit organizations (4 big).

Casterella *et al.* (2004) reviewed the relationship between profit quality and the audit industry leadership. In this study, profit quality is defined as abnormal accruals and possibility to reach analysts predictions about profit management. If abnormal accruals is bigger, profit quality is considered lower and if companies tend to manipulate the reported profit in order to meet targets about predicted profit, profit quality is considered low again. These researchers report that when an auditor is a leader of a specific industry, profit quality is higher.

Vanstraelen (2002) reviewed the relationship between auditor-employer and audit quality. In this review, long-term relationships between auditor and employer and

an auditors behavior was studied. Data approved by Belgium national bank in 1992-1996 were used to perform this study. The researcher divided companies into two groups: companies under financial pressure and companies without financial pressure. According to abovementioned considerations, it is specified that circulation of audit organizations seems to be appropriate for preserving audit value.

Walker and coauthors reviewed the empirical relationship between audit period and financial scandal. A number of 110 American companies, which developed financial corruptions in 1980-1991, were reviewed. The results indicated that the majority of financial scandals have happened in long-term relationships but the highest financial scandals have happened in short-term periods. Since financial corruption in long-term periods was low, the researchers concluded that circulation of audit organizations is not required for decreasing the rate of financial failures.

Research hypotheses:

- H₁: There is a negative relationship between diversification of audit organization and audit quality
- H₂: The size of audit organization decreases the conflict between diversification of audit organization and audit quality

MATERIALS AND METHODS

The model used to test the research hypotheses
The following model was used to test the first hypothesis:

$$AQ = \alpha_0 + \alpha_1 DT + \alpha_2 CUR + \alpha_3 INV + \alpha_4 LEV + \alpha_5 LMV + \alpha_6 LOSS + \alpha_7 ROA + \alpha_8 SDCFO + \alpha_9 SGROWTH + \alpha_{10} TENUR + \varepsilon$$

The judge method: to confirm the first hypothesis relying on above regression pattern it should be equal to $\alpha_1 < 0$. The following model is used to test the second hypothesis:

$$AQ = \beta_0 + \beta_1 DT + \beta_2 DT \times BIG + \beta_3 CUR + \beta_4 INV + \beta_5 LEV + \beta_6 LMV + \beta_7 LOSS + \beta_8 ROA + \beta_9 SGROWTH + \beta_{10} TENUR + \varepsilon$$

Judge method: To confirm the second hypothesis relying on above regression pattern, it should be equal to $|\beta_2| > |\beta_1|$.

Research variables and their measurement method

Dependent variable: Audit Quality (AQ): It is equal to an auditors industrial specialty, which is calculated through the two methods presented below:

First, market share of audit industry and second a function of both market share and portfolio share. Both specialty criteria have been calculated separately for each year. An auditor may be a specialist in industry K in year t, but not in year t-1. For each year t, the first criteria of industry specialty is based on market share of audit industry.

The first method: market share of audit company I in industry K for each year t is MKTSHER_{ik}, which is calculated as below:

$$MKTSHER_{ik} = \frac{\sum_{j=1}^{i_k} ASSETS_{ijk}}{\sum_{j=1}^{K_I} \sum_{j=1}^{j_k} ASSETS_{ijk}}$$

In which, I is auditors index (i = 1-4); j is the index of employers' companies; K is the index of auditor industry; i_k is the number of auditors in industry K; j_{ik} is the number of audited employers through audit I in industry K and ASSETS_{ijk} is the total assets for auditor I from employer j. This index classifies auditors in industries, when market share of auditors is bigger than or equal to 10% of time breaking point.

The second method: It records the market share of product (MKTSHER) or portfolio share (PORTSHER), which is calculated as below:

$$WMSCO = \left[\frac{1}{\text{no. of audit x companies}} \times 1.020 \right] \times \left[\frac{1}{\text{no. of industries}} \right]$$

If product, MKTSHER_{ik} × PORTSHER_{ik}, for year t is bigger than weighted amount of market share, the auditor is known as specialist in industry K for year t unless, he is known as non-specialist. Both dimensions (specialist or non-specialist) are shown as a dummy variable, so that if the auditor is known as a specialist it is equal to 1 and unless it is equal to 0.

In this research, market share is used as an index for an auditor's industrial specialty, because it shows the priority of industry to other auditors. Possession of high market shares also indicates that the auditor successfully distinguishes himself/herself from other competitors in regard to audit quality (Mayhew and Wilkins, 2003).

The auditors market share is calculated as: Total assets of employers in this industry is divided into total assets of employers in a specific audit company in a specific industry.

Following Palmrose (1986), organizations are considered as specialist in this research whose market share (above equation) is more than $[1/2 \times (\text{companies in an industry}/1)]$.

Independent variables

Diversification (DT): Can be measured as below:

$$DT = \sum P_i \times \text{LOG} \left(\frac{1}{P_i} \right)$$

In which, P_i is market share of industry I in total income.

Size of audit company (BIG): It is a dummy variable which is equal to 1 if audit company is effective and unless it is equal to 0.

Control variable:

- CUR: A current ratio, which is calculated by dividing current asset to current liability
- INV: An inventory ratio, which is calculated by dividing goods inventory to total assets
- LEV: Financial leverage which is calculated by dividing total liabilities to assets
- LMV: Normal logarithm of market value
- LOSS: A dummy variable which is equal to 1 if the operational profit level is negative and unless it is equal to 0
- ROA: Return on assets, which is calculated by dividing net profit to assets
- SGROWTH: The sales growth level which is calculated by dividing the difference in sales of the current year by the sales of the past year
- TENUR: The tenure period of audit which is equal to 1 if it is <5 year and unless it is equal to 0

Statistical population: According to research subject and its application, location domain of this research is listed companies in Tehran Stock Exchange which have the below qualifications:

- They have been active in tehran stock exchange up to the end of March 2006
- Their financial year ends in 29th of March.
- They have not changed their financial year in research period
- They have not stopped their activities in research time period
- They are not financial intermediation companies or banks
- Their financial statements and remarks have been completely available on Tehran stock exchange website in the 2007-2013 time span

Finally, after removing the companies which did not have such qualifications, a number of 181 companies were chosen as samples.

Data analysis methods: In this research, since the relationship type in the hypotheses is correlation and data scale type is relativity and variables collection is 2 or > 2, the most appropriate model to test the hypotheses is regression model. The model used in this research is logit model which follows logistic regression. Logit and probit models are used when the dependent variable is not observable. In such cases, the dependent variable is chosen as twofold choice. So, logistic regression model has been used to test the research hypotheses.

Dependent variables in logistic regression can take different shapes, in other words this logistic regression has no default for distribution of dependent variables. Linearity between variables lead to coefficients and Variance Inflation (VIF) being irrational. In this research, Wald and likelihood ratio test are used.

RESULTS AND DISCUSSION

The results of testing hypotheses

Testing the first hypothesis:

- H_0 : there is no negative relationship between diversification of audit organization and audit quality
- H_1 : there is a negative relationship between diversification of audit organization and audit quality

Statistical outcomes related to the anticipation table of the test model related to the first hypothesis has been summarized in Table 1 and 2.

Table 1: Classification table of first model anticipation

Overall model anticipation (%)			
Correct anticipation (%)	Audit quality		Observed
89.18	1.00	0.00	Audit quality
96.41	32.03	290.71	0.00
93.64	109.54	32.03	0.00

Table 2: statistical outcomes related to the first hypothesis

Pezodo determination coefficient	Likelihood ratio test		Significant index of kasmer and lam sho	
McFaden	K-score	Significant level	K-score	Significant level
0.6197	357.493	0.000	13.348	0.0953
Variables	Coefficients	Standard deviation	Wald Z test	Significant level
Fixed variable	-28.109	3.971	-7.079	0.0000
Diversification	-24.880	6.828	-3.644	0.0002
Current ratio	-2.534	0.582	4.353	0.0011
Inventory ratio	-1.339	2.248	-0.596	0.5458
Financial leverage	12.861	3.256	3.950	0.0001
Company value	3.271	0.366	8.937	0.0000
Loss	0.362	0.676	0.535	0.5860
Return on assets	-2.948	0.841	-3.505	0.0014
Sales growth	0.071	.0298	0.238	0.8029
Audit tenure period	0.640	0.489	1.309	0.1882

Considering statistical outcomes presented in Table 1, 89.18% of companies whose auditors have not been specialist in industry, have been anticipated correctly and 96.41% of companies whose auditors have been specialist in industry, have been anticipated correctly as well. That is model sensitivity in the determination of companies without specialist auditors is equal to 89.18% and for companies with specialist auditors it is equal to 96.41%. In total, this model has anticipated and classified 93.64% of companies which have had industrial specialist auditors.

To evaluate the goodness of fitting total model, Likelihood Ratio test (LR) is used which is K-score. So, here equivalence of F test is linear regression. The aim of the likelihood ratio test is to minimize the difference between anticipated possibility of the presence of a responder in a real class. Likelihood ratio is calculated according to difference in deviation levels. It means the presence of anticipation variables in a model minus deviation with the presence of anticipation variable in the model. According to the above table, significant level of testing the model is equal to zero and it is <5% error, so the goodness of model fitting is acceptable.

Kasmer and Lam Shu index in Table 2, is equal to 13.348 and its significant level is 0.0953 and it is bigger than 5%, which indicates that there are likeness in observed and expected cases for both diversification and audit quality factors and zero assumption is rejected. Pezodo determination coefficient, that is Mac Faden is equal to 0.6197 which should be between 0 and 1 and it indicates that independent variables have been able to explain the variance level. The obtained tests indicate that independent variables possess an acceptable explanation power.

According to the results obtained from Wald test, for testing the first hypothesis the significant level of this test for diversification variable as independent variable is equal to 0.0002 and it is <5% which indicates that zero assumption regarding inefficiency of variable is rejected and subsequently regression is significant.

Table 3: Classification table of the second model anticipation

Anticipation			
Observed	Audit quality		Correct anticipation (%)
Audit quality	0.00	1.00	95.99
0.00	293.57	29.17	
1.00	29.17	112.40	97.42
Total			96.84

Table 4: statistical outcomes related to the second hypothesis

Pezodo determination coefficient	Likelihood ratio test		Significant index of kasmer and lam sho	
McFaden	K-score	Significant level	K-score	Significant level
0.6502	375.108	0.000	12.773	0.1424
Variables	Coefficients	Standard deviation	Wald Z test	Significant level
Fixed variable	-25.408	3.962	-6.413	0.0000
Diversification	-3.076	0.845	-3.640	0.0067
Interaction between diversification and size of audit organization	-6.493	1.593	-4.078	0.0000
Current ratio	-0.329	0.094	-3.500	0.0012
Inventory ratio	-3.126	2.287	-1.367	0.1698
Financial leverage	11.327	3.143	3.604	0.0021
Company value	3.163	.384	8.237	0.0000
Loss	0.571	0.682	0.838	0.3985
Return on assets	-0.554	0.156	-3.551	0.0015
Sales growth	-0.175	0.438	-0.400	0.6677
Audit tenure period	0.687	0.553	1.242	0.2118

Considering coefficient sign, there is negative and significant relationship between diversification and audit quality. But, only the significant level of control variables such as inventory ratio, loss, sales growth and tenure period is >0.05 and it is not significant and H_0 assumption for these four variables are accepted. So, only these four factors are eliminated from the model and the other variables are entered to the model because they are significant. Therefore, the final model of the first hypothesis is as:

$$\ln\left(\frac{p}{1-p}\right) = -28.109 - 24.880DT - 2.534CUR + 12.861LEV + 3.271LMV - 2.948ROA + \varepsilon$$

Testing the second hypothesis:

- H_0 : Size of audit organization increases the conflict between diversification of audit organization and audit quality
- H_1 : Size of audit organization decreases the conflict between diversification of audit organization and audit quality

Statistical outcomes related to anticipation table of testing the second hypothesis have been summarized in Table 3 and 4.

Considering statistical outcomes presented in Table 3, 95.99% of companies whose auditors have not been industrial specialists, have been anticipated correctly and 97.42% of companies whose auditors have been industrial

specialists, have been anticipated correctly as well. That is model sensitivity in determination of companies without specialist auditors is equal to 95.99% and for companies with specialist auditors it is equal to 97.42%. In total, this model has anticipated and classified 96.84% of companies which have had specialist auditors in industry.

To evaluate the goodness of fitting total model, Likelihood Ratio test (LR) is used which is K-score. So, here the equivalence of F test is linear regression. The aim of the likelihood ratio test is to minimize the difference between anticipated possibility of presence of a responder in a real class. Likelihood ratio is calculated according to the difference in deviation levels. It means the presence of anticipation variable in model minus deviation with presence of anticipation variable in model. According to above table, significant level of testing the model is equal to zero and it is smaller than 5% error, so the goodness of model fitting is acceptable.

Kasmer and Lam Shu's index in Table 4, is equal to 12.773 and its significant level is 0.1424 and it is bigger than 0.05 which indicates that there are likeness in observed and expected cases for both diversification and audit quality factors and zero assumption is rejected. Pezodo determination coefficient, that is Mac Faden is equal to 0.6502, which should be between 0 and 1 and it indicates that independent variables have been able to explain the variance level. The obtained tests indicate that independent variables possess an acceptable explanation power.

According to the results obtained from Wald's test, for testing the second hypothesis the significant level of

this test for the diversification variable as an independent variable is equal to zero and it is less than 0.05 which indicates that zero assumption regarding inefficiency of variable is rejected and subsequently regression is significant. Considering coefficient sign, it can be said that the size of audit organization decreases the conflict between diversification of audit organization and audit quality. But, only the significance level of the control variables such as inventory ratio, loss, sales growth and tenure period is higher than 0.05 and it is not significant and H_0 assumption for these four variables are accepted. So, only these four factors are eliminated from the model and the other variables are entered in the model because they are significant. Therefore, final model of the second hypothesis is as:

$$\ln\left(\frac{p}{1-p}\right) = -25.408 - 3.076DT - 6.496BIG \times \\ DT - 0.329CUR + 11.327LEV + \\ 3.163LMV - 0.554ROA + \varepsilon$$

CONCLUSION

Results obtained from testing the first hypothesis: In a situation in which the number of organizations are rapidly increasing, customers face more diverse choices. However, diversity in service levels is very much, only the presence of difference in services level does not lead to absorbing customers and increasing their faithfulness to organizations. The important point is the quality of services to customers and management of relations with customers; an issue which is heavily attractive for big service providing organizations, such as successful financial organizations.

Some researchers suggest that diversification has a negative impact on company performance. Diversification often increases the production cost, lead to managerial conflict, produce more complexities in the company and prevent companies in responding to external changes. As mentioned in previous sections, the result of testing the first hypothesis was that diversification of audit organization decreases the audit quality. A reason for this is that different industries have specific complexities and auditors do not have similar information about specific industries and their performance quality often is affected by different projects. Nevertheless, if diversification gets too widespread (unrelated diversification), it may have negative impacts on business unit performance due to lack of savings resulted from developing dimensions of competences.

Results obtained from testing the second hypothesis audit quality is a function of the number of performed

audit procedures and number of auditors and clearly, big audit organizations have more resources to lead audit tests. Anyway, applying resources to increase the audit quality is more important than usability of resources.

Davidson and Neu (1993) indicated that big audit organizations have bigger customers. Hence, market expectancy for detecting the existing distortions in financial statements by auditors increases. They state that most of empirical researches regarding audit quality focus on this assumption that bigger auditors (with brands) have higher observation abilities than smaller auditors (without brands).

The result of testing the Second hypothesis was that size of audit organization decreases the conflict between diversification of audit organization and audit quality. It happens due to the issue that bigger audit organizations have higher professional qualifications due to more highly talented employees. It is assumed that such organizations provide higher quality audit services due to their access to information and more facilities to train auditors.

RECOMMENDATIONS

It is therefore, suggested that audit organizations perform diversification through merging several audit organizations because they can gain the required specialty by increasing efficient employees which leads to the increase in audit quality and subsequently increases the reputation and income.

It is recommended to perform present research by applying other models for measuring the audit quality through optional accruals. It is recommended to review the diversity of audit organization services and its impact on audit quality.

LIMITATIONS

There have been limitations in implementation of the present research, which are as follow: Due to limitations in access to companies' information, only information of listed companies in Tehran stock exchange was used, while a portion of audit companies contracts are related to the companies which are not listed in Tehran Stock Exchange. So, this research neglected the review of information related to the market of companies not listed in Tehran stock exchange and its impact.

Considering that research sample has been chosen out of companies listed in Tehran Stock Exchange and sample companies are not necessarily representative of total active economic units in regard to size, industry, ownership structure and products type, so the generalization of findings should be performed carefully.

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