The relationship between audit quality and Investment efficiency

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Abstract

The purpose of the present study is to investigate the audit quality and Investment efficiency of the listed companies on the Tehran Stock Exchange (TSE). The population includes 94 firms selected through systematic sampling. The data is collected from the audited financial statements of the firms provided by TSE's website from 2008 to 2015. In this study the variables, auditor industry specialization, auditor reputation, auditor tenure and auditor independence has been used to investigate audit quality. The results of multiple linear regression analysis show that there is a significant relationship audit quality and Investment efficiency.

Keywords: Audit quality, investment efficiency, auditor reputation.

1. Introduction

One of the most important issues in the process of value creation in the company, which is investment. Issues such as information asymmetry and agency problems associated with deep (Yu et al., 2012). Sometimes, agency problems caused by over-investment managers in the pursuit of personal interests and the abuse of free cash flows in projects with negative NPV is

(Jensen, 1986) and (Stulz, 1990). On the one hand, most companies now due to agency problems are over investment. seriously of free cash flow to exploit this approach (Xin, 2007). On the other hand, financing constraints and a serious shortage in investment, relating to information asymmetry (Zheng et al., 2001). Researchers such as (Biddle and Hilary, 2006); (Biddle et al., 2009), (Li and Wang, 2010); (Chen et al., 2011) examined the relationship between financial reporting quality and investment efficiency). This study, the literature related in this field by examining the role of audit quality in impact on the performance of the investment efficiency. In fact, this study concerns exist in relation to the role of auditors, the audit evaluated the impact on investment performance decreases. While most previous university studies, is dedicated to the investment, the role of auditors in relation to managers investment decisions, has not been sufficient attention (Das & Pandit, 2010). Previous studies have noted that audit quality can increase the efficiency of investment. Despite the theoretical support of this issue, is little empirical evidence, especially in our country, into these allegations has been gathered. According to what has been said, the question now is that, is there a relationship between audit quality and Investment efficiency of the listed companies on the Tehran Stock Exchange (TSE)?

2. Theoretical foundations background research

(Chang et al., 2008) presented a model and provide empirical evidence showing that auditor quality affects the financing decisions of companies, and that higher audit quality reduces the impact of market conditions on client financial decisions and capital structure. Consistent with their analytical predictions, they found that companies audited by Big 6 firms are more likely to issue equity as opposed to debt than are those audited by small audit firms. They also found that companies audited by Big 6 auditors are able to make larger equity issues than are those audited by small auditors, but the difference narrows when market conditions improve. Additional results showed that the debt ratios of companies decrease less in response to favorable market conditions when auditor quality is high, at least over the medium term. (Biddle. et al., 2009) provided evidence of both in documenting a conditional negative (positive) association between financial reporting quality and investment for firms operating in settings more prone to over-investment (underinvestment). Firms with higher financial reporting quality also are found to deviate less from predicted investment levels and show less sensitivity to macroeconomic conditions. They suggested that one mechanism linking reporting quality and investment efficiency is a reduction of frictions such as moral hazard and adverse selection that hamper efficient investment. (Cheng et al., 2013) provided more direct evidence on the causal relation between the quality of financial reporting and investment efficiency. They examined the

investment behavior of a sample of firms that disclosed internal control weaknesses under the Sarbanes-Oxley Act. They found that prior to the disclosure, these firms under-invest (over-invest) when they are financially constrained (unconstrained). More importantly, they found that after the disclosure, these firms' investment efficiency improves significantly. (Lenard et.al., 2013) examined how earnings quality affects the investment decisions of Chinese companies who employ non-Big 4 auditors. They found that more important clients have significantly higher investment than less important clients, and that discretionary accruals are significant indicators of over-investment. Less important clients are more conservative in their investments, although they have more investment opportunities. They also observed that the proportion of over-investment drops for clients, regardless of their importance, whose auditors have a long tenure. (Bae & Choi, 2012) examined whether the investment efficiency of client firms with industry specialist auditors is higher relative to that with non-specialist auditors. They used a large sample from the period1976 to 2005; they found that investment efficiency of client firms with industry specialist auditors is significantly higher than that with non-specialist auditors. Furthermore, industry specialist auditors discourage both over-investment and under-investment, although they did so more in the over-investment side relative to the under-investment side. The results were generally unaffected by the different definitions of specialist auditors, clients' firm size, yearly regressions, differences in the market share of specialist auditors, and the potential self-selection bias. (Biddle & Hilary, 2006) examined how accounting quality relates to firm-level capital investment efficiency. Their first hypothesis was that higher quality accounting enhances investment efficiency by reducing information asymmetry between managers and outside suppliers of capital. Their second hypothesis was that this effect should be stronger in economies where financing is largely provided through arm's-length transactions compared with countries where creditors supply more capital. Their results were consistent with these hypotheses both across and within countries. (chen et.al., 2010) examined the role of financial reporting quality (FRQ) in private firms from emerging markets, a setting in which extant research suggests that FRQ would be less conducive to the mitigation of investment inefficiencies. They further found that the relation between FRQ and investment efficiency is increasing in bank financing and decreasing in incentives to minimize earnings for tax purposes.

3. Hypothesis research

Ha : There is a significant relationship between audit quality and investment efficiency.

Ha_1: There is a significant relationship between auditor industry specialization and investment efficiency.

Ha_2: There is a significant relationship between auditor reputation and investment efficiency.

Ha_3: There is a significant relationship between auditor tenure and investment efficiency.

Ha_4: There is a significant relationship between auditor independence and investment efficienc

4. Research method

Population and sample

The present research studies two types of industries; the chemical and pharmaceutical listed companies on the TSE. The sample comprises firms that meet the following conditions:

1. Firms that have been listed in the stock exchange before 2015;

2. Firms whose financial year ends at the end of the Iranian calendar;

3. Firms that have no financial year changes;

4. Firms that have been operating in TSE during the period of interest;

5. Firms that have data available for the period of interest;

6. Investment companies are excluded.

Given these conditions, 94 firms were selected as sample.

Variables : Dependent variable

In this study, the dependent variable is investment efficiency.

1) $Inv_{i,t} = \beta_0 + \beta_1 \text{Grow}_{i,t-1} + \Sigma \varphi_j Control_{j,t,t-1} + V_{i,t}$

$Inv_{i,t}$: $Inv_{i,t}$ is the investment level for firm i in year t .

$\text{Grow}_{i,t-1}$: $\text{Grow}_{i,t-1}$ equals the natural log of total assets at the end of year t-1 divided by total assets at the end of year t-2.

$Control_{j,t,t-1}$: Control variables are that include the following:

$\text{lev}_{i,t}$: Financial Leverage for firm i in year t.

$\text{Age}_{i,t-1}$: Corporation age since the date of foundation for firm i in year t-1.

$\text{Cash}_{i,t-1}$: Cash flows and short-term investment ratio on assets average assets.

$Size_{i,t-1}$: Natural logarithm of total assets.

$Ret_{i,t-1}$: The present research uses the model 2 for measuring $Ret_{i,t-1}$.

2) $R_{i,t} = [P_t(1 + \alpha + \beta) - (P_{t-1} - C) + DPS]/(P_{t-1} - C)$

$R_{i,t}$: Annual stock return.

P_t: Stock price for firm i in year t.

α: Capital increase percent from cash and receivables

β: Capital increase percent from reserves and dividend

P_{t-1}: Stock price for firm i in year t-1.

C: The amount of stock subscription.

DPS: Dividend per share.

Independent variables

In this study, the independent variables are auditor industry specialization, auditor reputation, and Auditor tenure and auditor independence. The present research uses the model proposed by Sun& Liu, (2013) for measuring auditor industry specialization. The auditor reputation is obtained by dividing the total assets of all employers in a particular audit firm in the total stock on total assets of listed companies on the stock exchange. The present research uses the earnings management (discretionary accruals) for measuring audit quality. The present research uses the model proposed by Jones (1995) for measuring earnings management.

3) $NDA_{i,t} = \alpha_1(\dfrac{1}{A_{i,t-1}}) + \alpha_2\left(\dfrac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t-1}}\right) + \alpha_3(\dfrac{PPE_{i,t}}{A_{i,t-1}})$

$NDA_{i,t}$: Non-discretionary accruals

$TA : TA$ is total accrual.

4) $TA_{i,t} = (\Delta CA_{i,t} - \Delta Cash_{i,t}) + (\Delta DCL_{i,t} - \Delta STD_{i,t}) + DEP_{i,t}$

$A_{i,t-1}$: Total assets of the company in the previous year.

$\Delta REV_{i,t}$: $\Delta REV_{i,t}$ is the annual change in revenues scaled by lagged total assets.

$\Delta REC_{i,t}$: Changes in accounts of receivable net current year compared to last year.

$PPE_{i,t}$: $PPE_{i,t}$ is property, plant, and equipment for firm i at year t, scaled by lagged total assets.

$\Delta CA_{i,t}$: $\Delta CA_{i,t}$ The change in current assets current year compared to last year.

$\Delta Cash_{i,t}$: The change in cash flow current year compared to last year.

$\Delta DCL_{i,t}$: Change in debt this year compared to last year.

$\Delta STD_{i,t}$: The change in short-term interest long-term debt current year compared to last year.

$DEP_{i,t}$: The cost of depreciation of tangible and intangible assets current year.

The present research uses the model 5, for measuring involuntary accruals.

5) $NDA_{i,t} = \alpha_1(\dfrac{1}{A_{i,t-1}}) + \alpha_2\left(\dfrac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t-1}}\right) + \alpha_3(\dfrac{PPE_{i,t}}{A_{i,t-1}})$

We use the model 6, for measuring voluntary accruals (DA).

6) $NDA_{i,t} = DA_{i,t}$

Control Variables

In this study, the dependent variables are firm size, Tangible assets (TANG) and Market-to-book ratio (MBV), Capital Structure (CS), Cash flows operations sales (CFOSALE), Operating cycle (OC), financial health.

SIZE: firm size is the natural logarithm of total sales (in thousands of euros).

TANG: TANG is Tangible assets.

MBV: market-to-book ratio. It is the ratio of (market value of equity plus book value of liabilities) divided by the book value of total assets.

CS: CS is Capital Structure.

CFOSALE: CFOSALE is Cash flow operations sales.

OC: operating cycle.

Financial health: The present research uses the model proposed by (Cheng et al. 2013) and (Das & Pandit, 2010) for measuring financial health.

7) $Z = 0.717X_1 (0.847X_2 + 3.107X_3 + 0.420X_4 + 0.996X_5)$

Z: The total index.

X_1: The ratio of working capital to total assets.

X_2: The ratio of the retained earnings to total assets.

X_3: Earnings before interest and taxes to total assets ratio.

X_4: The company's book value to book value of total of debt.

X_5: Sales ratio to total assets.

6. Descriptive analysis of data

Multivariate regression analysis was applied at the 5% significance level for testing the hypotheses. Descriptive and inferential (multivariate regression analyses) analyses are used for testing the hypotheses of the research. The data is collected from 94 samples firms listed in Tehran Stock Exchange for the period from 2010 to 2015. Table 1 provides mean, median, standard deviation, maximum, and minimum values for the research variables.

Table 1: Descriptive Statistics

	N	Mean	Maximum	Minimum	Std. Deviation
INV	470	0.229	0.066	0.001	0.106
SEP_AUD	470	0.135	0.084	0.001	0.325
REP_AUD	470	0.270	0.706	0.001	0.284
TEN_AUD	470	3.603	6	2	2.014
INDE_AUD	470	0.088	0.557	0.001	0.082
SIZE	470	11.092	12.95	10.87	0.325
MVB	470	1.642	7.012	0.088	1.325
TANG	470	0.236	0.798	0.001	0.198
CS	470	0.087	0.6047	0.001	0.099
CFOSAL	470	0.271	2.154	-0.745	0.187
OC	470	2.344	4.175	0.184	0.311

7. The results of the study hypothesis test

In the regression model, the effect of the independent variables (SEP_AUD, SEP_AUD, REP_AUD, TEN_AUD, and INDE_AUD) on the investment efficiency of the sample firms is examined. A multivariate linear regression model is used at the 5% significance level for testing the hypotheses. If there is no relationship between the independent variables and the

dependent variable, all the coefficients in the regression model must be equal to zero. Thus, we can test the significance of the regression model, which is often done using F test. If the obtained F-statistic is less than the Table value of F at the 95% confidence level, the regression model will be significant.

Hypothesis : Ha_1

$\textbf{Model}(1) : \text{INV}_{i,t} =$
$\beta_0 + \beta_1 \text{SPEC}_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 MBV_{i,t} + \beta_4 TANG_{i,t} + \beta_5 CS_{i,t} + + \beta_6 CFOSALE_{i,t} + \beta_7 OC_{i,t} +$
$\beta_1 ALT\_Z_{i,t} + e$

According to the first hypothesis, Institutional auditor industry specialization (SPEC) is significantly associated with investment efficiency .Based on the results of multivariate regression model (Table 2), SPEC has a beta coefficient of -0.007 and p-value of 0.741. Therefore, there no is significant relationship between SPEC and investment efficiency at 5% significance level.

Table 2: The results of estimating the regression model (1)

Model(1)	Unstandardized Coefficients			
	B	Std. Error	t	Sig.
Constant coefficient	-0.840	1.058	-0.887	0.391
SEP_AUD	-0.007	0.031	-0.44	0.741
SIZE	-0.184	0.087	-2.148	0.025
MVB	0.132	0.065	2.254	0.049
TANG	-0.008	0.054	-0.198	0.854
CS	-0.005	0.032	-0.208	0.874
CFOSAL	0.164	0.348	0.609	0.552
OC	-0.200	0.184	-1.170	0.386
ALT_Z	0.107	0.082	1.321	0.321

Table 3: Model Summary

Model	R Square	F	Durbin-Watson	Sig
1	0.34	2.991	2.415	0.000

Table 4: Results of testing the first hypothesis with multivariate regression analysis

Variable	Beta	Sig	Result
SEP_AUD	-0.007	0.741	Rejected

Hypothesis : Ha_2

$\mathbf{Model(2)}$: $\mathrm{INV}_{i,t} =$
$\beta_0 + \beta_1 \mathrm{REPU}_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 MBV_{i,t} + \beta_4 TANG_{i,t} + \beta_5 CS_{i,t} + + \beta_6 CFOSALE_{i,t} + \beta_7 OC_{i,t} + \beta_1 ALT\_Z_{i,t} + e$

According to the second hypothesis, auditor reputation (REPU) is significantly associated with investment efficiency. Based on the results of multivariate regression model (Table5), REPU has a beta coefficient of -0.401and p-value of 0.039. Therefore, there is a positive significant relationship between REPU and investment efficiency at 5% significance level.

Table 5: The results of estimating the regression model (2)

Model(2)	Unstandardized Coefficients		t	Sig.
	B	Std. Error	t	Sig.
Constant coefficient	-0.901	0.771	-1.325	0.323
REPU	-0.401	0.145	-2.874	0.039
SIZE	-0.341	0.084	-3.141	0.003
MVB	-0.016	0.022	-0.804	0.457
TANG	0.015	0.021	0.741	0.521
CS	-0.048	0.017	-2.365	0.005

CFOSAL	0.133	0.308	0.601	0.585
OC	-0.329	0.222	-2.321	0.039
ALT_Z	-0.044	0.074	-0.746	0.547

Table 6: Model Summary

Model	R Square	F	Durbin-Watson	Sig
2	0.43	2.94	2.254	0.003

Table 7: Testing the second hypothesis with multivariate regression analysis

Variable	Beta	Sig	Result
REPU	-0.401	0.039	Accepted

Hypothesis : Ha_3

Model(**3**): $\text{INV}_{i,t} =$
$\beta_0 + \beta_1 \text{TENURE}_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 MBV_{i,t} + \beta_4 TANG_{i,t} + \beta_5 CS_{i,t} + +\beta_6 CFOSALE_{i,t} + \beta_7 OC_{i,t} + \beta_1 ALT\_Z_{i,t} + e$

According to the third hypothesis, auditor tenure (TENURE) is significantly associated with investment efficiency. Based on the results of multivariate regression model (Table8), TENURE has a beta coefficient of -0.342 and p-value of 0.008. Therefore, there is a negative significant relationship between TENURE and investment efficiency at 5% significance level.

Table 8: The results of estimating the regression model (3)

	Unstandardized Coefficients			
Model(3)	B	Std. Error	t	Sig.
Constant coefficient	-0.599	0.741	-0.888	0.389
TENURE	-0.342	0.133	2.239	0.008
SIZE	-0.154	0.074	-2.325	0.048

MVB	0.057	0.035	1.741	0.112
TANG	-0.016	0.042	-0.360	0.701
CS	-0.136	0.055	-2.415	0.016
CFOSAL	0.213	0.324	0.704	0.658
OC	-0.198	0.241	-1.525	0.321
ALT_Z	0.098	0.079	1.350	0.312

Table 9: Model Summary

Model	R Square	F	Durbin-Watson	Sig
3	0.35	2.680	2.231	0.009

Table 10: Testing the third hypothesis with multivariate regression analysis

Variable	Beta	Sig	Result
TENURE	-0.342	0.008	Accepted

Hypothesis : Ha_4

Model(4): $\text{INV}_{i,t} = \beta_0 + \beta_1 \text{INDE}_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 MBV_{i,t} + \beta_4 TANG_{i,t} + \beta_5 CS_{i,t} + + \beta_6 CFOSALE_{i,t} + \beta_7 OC_{i,t} + \beta_1 ALT\_Z_{i,t} + e$

According to the fourth hypothesis, auditor independence (INDE) is significantly associated with investment efficiency. Based on the results of multivariate regression model (Table11), INDE has a beta coefficient of 0.121 and p-value of 0.017.Therefore; there is positive significant relationship between INDE and investment efficiency at 5% significance level.

Table 11: The results of estimating the regression model (4)

	Unstandardized Coefficients			
Model(4)	B	Std. Error	t	Sig.

Constant coefficient	-0.774	0.666	-1.125	0.335
INDE	0.121	0.046	2.652	0.017
SIZE	-0.312	0.078	-2.981	0.010
MVB	-0.032	0.021	-1.311	0. 310
TANG	0.032	0.018	1.019	0.172
CS	-0.049	0.016	-3.112	0.003
CFOSAL	0.165	0304	0.789	0.467
OC	0.163	0.111	1.452	0.146
ALT_Z	-0.068	0.068	-1.087	0.312

Table 12: Model Summary

Model	R Square	F	Durbin-Watson	Sig
4	0.046	3.211	2.201	0.001

Table 13: Testing the fourth hypothesis with multivariate regression analysis

Variable	Beta	Sig	Result
INDE	0.121	0.017	Accepted

8. Conclusion

The present research examined the relationship between four variables (auditor industry specialization, auditor reputation, and auditor tenure and auditor independence) and investment efficiency of the chemical and pharmaceutical firms listed in Tehran Stock Exchange. The results of multivariate regression rejected one the hypotheses of the research. The results of multiple linear regression analysis show that there is a significant relationship between auditor reputation, and auditor tenure and auditor independence with investment efficiency. According

to findings, that there is no a significant relationship between auditor industry specialization with investment efficiency. But positive coefficient obtained from this variable, the consistency of these findings indicates the theoretical foundations. This property is also expected to highlight the role that audit quality is to increase investment efficiency. This finding is consistent with results (Das & Pandit, 2010). Also, this finding isn't consistent with results (Lenard & Yu, 2012).

Limitation: The limitation is related to the lack of classified data in the database of TSE. Therefore, the researchers were forced to use the audited reports of the firms and data collection became a very time consuming process.

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