Accounting Information Quality, Investment Efficiency, and Auditor Specialization

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ABSTRACT

This study was conducted aiming at examining the impact of accounting information quality (AIQ) on overinvestment and underinvestment problems by considering the impact of auditor specialization on the industry. The statistical population consisted of the listed companies on the Tehran Stock Exchange from 2013 to 2017. According to the result, accounting information quality contributed to the reduction of overinvestment and underinvestment problems. Also, the auditor specialization was mostly effective in improving investment efficiency. It was also found that accounting information quality and the auditor specialization were partially alternative mechanisms in enhancing investment efficiency. There was a significant positive relationship between accounting information quality and investment efficiency in companies where the auditor was a specialist in the industry. The conclusion of this paper might be the first empirical evidence to support prior research that auditor specialization on the industry is positively related to investment efficiency at the Tehran Stock Exchange. Also, it shows the impact of the replacement of auditor specialization and accounting information quality was studied.

Keywords:

investment efficiency, underinvestment, overinvestment, auditor specialization, accounting information quality.

1. Introduction

Accounting as a mechanism for enabling the provision of relevant information, as well as enabling better decision-making by investors, has social benefits through improving the functioning of the securities markets (Robu and Robu, 2015). The auditor specialization in the industry is considered to be a differentiation strategy between audit firms, whereby audit firms can distinguish themselves from competitors in fulfilling their customers' demands and compete with their competitors in features other than price (Stanley and DeZoort, 2007). The term earnings are among the reported benchmarks to measure accounting information quality that has never been agreed upon between different models. Earnings are one of the most unstable concepts in the business world. Some financial analysts regard earnings quality as ordinary, continuous, recurring, and generating cash flow from operations. According to them, earnings quality is a figure between reported net profit and cash flow from operations minus non-recurring figures (Verdi, 2006).

There are always many investment opportunities facing businesses, and they need to make different decisions on an optimal investment. Information asymmetry and conflicts of interest prevent optimal investment. One of the most essential solutions in the business world today is the development and expansion of investment. Due to resource constraints, increasing investment efficiency is among the most critical issues besides developing investment. As a result, if a business selects all projects with a positive net present value (NPV), it is defined as efficient in investment. On the other hand, audit firms have well realized that in order not to lose their market share, they must train their institutions and staff in line with the requirements of up-to-date technologies in particular industries (Saqafi et al., 2011). As agency costs increase, the demand for high quality audits increases. The auditor specialization in the industry directly enhances the credit provided by auditors, thereby providing specialist auditors with more effective auditing (Blandon and Bosch, 2018). The auditor specialization can be used to alleviate the problems of information asymmetry. The auditor specialization in the industry can be enhanced through extensive auditing experience, training of specialist staff, and significant investments in information technology. Although limited evidence is available,

high-quality auditing is very useful for improving investment efficiency, especially concerning overinvestment (Balsam et al., 2003).

According to the above, this study was conducted aimed at examining investigate the impact of auditor specialization and accounting information quality on overinvestment and underinvestment and impact of auditor specialization on the relationship between accounting information quality and investment efficiency in listed companies on Tehran Stock Exchange. The impact of the auditor specialization and accounting information quality of listed companies on the Tehran Stock Exchange on the decisions made by investors in the financial market were investigated. Also, the impact of the replacement of auditor specialization and accounting information quality was studied. Increasing the investment efficiency of companies increases the return on investment for investors in the capital market and improves this market. Investigating the Relationship between financial reporting quality, auditor specialization, and investment efficiency in the Iranian Stock Exchange, which is not an efficient market and is a relatively new market, is a topic of interest.

2. Literature review
2.1. Investment efficiency and the accounting information quality (AIQ)

A large body of literature shows that companies can improve the accounting information quality. According to the neo-classical theory, (Yoshikawa, 1980; Hayashi, 1982; Andrew, 1983) firms invest until the marginal benefit equals the marginal cost of this investment so as to maximize their values. According to the Keynesian framework (Gordon, 1992; Crotty, 1992) investment is determined by the preference for growth or for financial security, and according to the agency framework (Chen et al., 2011) which considers information asymmetry problems, companies can deviate from their optimal investment levels and therefore suffer from overinvestment or under-investment. Gomariz and Bellesta (2014) develop a framework for analyzing the role of the asymmetric information in investment efficiency through information problems, such as moral hazard and adverse selection.

However, in the agency theory (Healy and Palepu, 2001; Hope and Thomas, 2008; Gomariz and Bellesta,

2014; Martinez et al., 2015), there are various control mechanisms to attenuate information asymmetries and information risk and to enable better supervision of managerial activity that mitigates the opportunistic behavior of managers, such as the AIQ.

A great section of the pertinent literature associates the AIQ with investment efficiency. Since higher AIQ makes managers more accountable by allowing better monitoring, and it may reduce adverse selection and moral hazard, and thereafter decreases information asymmetries, it could thereby greatly reduce the overinvestment and the underinvestment problems. In addition, the AIQ could improve investment efficiency by enabling managers to make better investment decisions through a better identification of projects and more truthful accounting numbers for internal decision makers (Bushman and Smith, 2001; McNichols and Stubben, 2008; Gomariz and Bellesta, 2014). An Iranian study indicates financial reporting quality doesn't have relationship with over-investment but there is negative relationship between quality of financial reporting and under-investment.this result may be attribute to inefficient capital market of Iran(Gilanian and others.2012).

Empirically, prior studies argue and find evidence that earnings management leads to overinvestment because it distorts the information used by managers (McNichols and Stubben, 2008). In turn, Hirshleifer et al. (2004), Biddle et al. (2009) and Chen et al. (2011) examine the effect of information quality on two inefficient scenarios, overinvestment and underinvestment, and reported that higher information quality helps greatly in encouraging underinvestment companies to make investments, and overinvestment companies to decrease their investment level. Consistent with this view, Gomariz and Bellesta (2014) find that conservatism leads to reducing both overinvestment and underinvestment, because it reduces investment-cash flow sensitivity with regard to overinvestment firms and facilitates access to external financing regarding underinvestment firms.

In this respect, the first hypothesis set up as follows:

H_1: The investment efficiency of companies with higher accounting information quality is higher.

H_{1a}: The overinvestment problems of companies with higher accounting information quality is lower.

H_{1b}: The underinvestment problems of companies with higher accounting information quality is lower.

2.2. Investment efficiency and auditor specialization

In Some previously conducted studies, it has been shown that the auditor's ability and competence highlighting rigor and independence, can be assessed by its industry specialization (Gramling and Stone, 2001; Velury, 2003; Hammersley, 2006; Moroney, 2007; Autore et al., 2009; Hakim and Omri, 2010; DeBoskey and Jiang, 2012). Knowledge of the activity sector of the audited firms should be useful in the investment evaluation.

By learning about the business of the client company, its strategies, motivation and accounting information system and accessing knowledge of the type of the frequency of potential errors and so on, auditors evaluate the accounting results (Hakim and Omri, 2010; Sun and Liu, 2011). In turn, Hammersley (2006) and Stanley and DeZoort (2007) predict that the auditor specialization in a particular industry has considerable experience and significant investments in technology adapted to this particular sector. The specialist auditors are particularly relevant in this area and are likely to provide a relatively high audit quality.

In fact, appealing to a specialized auditor service can provide guaranteed assurance as to the information quality. The authors found that firms audited by a qualified auditor communicate forecast information on future cash flows more credibly than those audited by a non-specialist auditor.

The role of the auditor specialization in reducing managers' discretion and disciplining their investment decisions has been discussed in the related literature mainly by Gul et al. (2009) and DeBoskey and Jiang (2012). However, this literature has also emphasized the role played by auditors under information asymmetry, highlighting that the use of the auditor specialization is a mechanism whereby we can attenuate informational asymmetries and agency costs between shareholders, creditors and managers.

Auditors seem to have difficulty measuring amounts of discretionary part and have been forced to reissue their reports because of regulators findings (Balsam et al., 2003; DeBoskey and Jiang, 2012). Hence, an empirical question may be posed as to whether the auditor industry specialization is similarly associated with investment efficiency.

An examination of the literature suggests that firms with high investment opportunities may need

high quality audits because they have a weak internal control system which may not keep up with the growth pace, resulting in higher control and audit risk (Lai, 2009). Gul et al. (2003) suggest that discretionary accruals help to increase audit risk because they are inherently more difficult to audit.

Based on this, the second hypothesis and its sub-hypotheses are as follows:

H_2: The investment efficiency of companies using the services of auditors specializing in the industry is higher.

H_{2a}: The overinvestment problems of companies using the services of auditor specializing in the industry is lower.

H_{2b}: The underinvestment problems of companies using the services of auditor specializing in the industry is lower.

2.3. The AIQ effect on investment efficiency conditioned to the auditor specialization

Aside from checking the isolated effect of the accounting information quality and the auditor specialization on investment efficiency (Biddle and Hilary, 2006; DeBoskey and Jiang, 2012; Gomariz and Bellesta, 2014; Lu et al., 2016), in this study, their interaction effect was examined, i.e., we investigate whether the effect of the AIQ on investment efficiency is increasing or decreasing with the presence of the auditor industry specialization.

In this sense, the AIQ effect on investment decisions could be mitigated by the absence of the specialist auditors because auditor specialization in a given sector have considerable experience and may exercise their oversight role on management in a bid to reduce overinvestment and can also be beneficial for managers to make positive investments in situations of underinvestment.

According to this, the auditor specialization stands as a crucial instrument useful for reducing the information asymmetry and the earnings management (DeBoskey and Jiang, 2012; Mary and Bing, 2012). Hence, it follows that the AIQ impact on investment efficiency would turn out to be stronger for a company whose auditor is an industry specialist. The specialist auditor can mitigate the adverse selection and moral hazard and can provide guarantees to the information quality.

Accordingly, the third hypothesis which is put forward stipulates that the relationship between the AIQ and the investment efficiency depends highly on the presence of the auditor specialization.

H_3: There is a significant relationship between investment efficiency and accounting information quality in companies with specialist auditors.

H_{3a}: There is a significant relationship between the reduction of overinvestment problems and using specialist auditors and IAQ.

H_{3b}: There is a significant relationship between the reduction of underinvestment problems and using specialist auditors and IAQ.

3. Methodology
3.1. Type of study

The methodology used in research – quantitative versus qualitative – can refer to several things, especially data, or techniques for collecting and processing such data. Data collection methods are diversified: semi-informal interviews/interviews, ordinary conversations, observation, study of written or visual documents, etc.

The qualitative technique is sometimes used in a case study, but the practice of this technique is too difficult in the Iranian context. Indeed, for some projects, one cannot imagine access to the markets.

The qualitative method is characterized by its practical inefficiency in the field, since the criteria of loyalty, credibility, validation and transferability can be lost before the professional secrets. This study does not focus on a qualitative method because the study region stimulates it.

We have been able to use a quantitative method which refers to work whose data are statistically analyzable. For most researchers, talking about quantitative research means studying large duly selected samples, whereas the qualitative searches covered usually only some cases. In this study, the quantitative technique allows for better testing of theories and assumptions, and allows measuring more rigorously the used variables.

In addition, the qualitative method cannot be used since the practice of the case study is difficult in this context. Indeed, Iran is characterized by strong competition in the economic market whereby professional secrets become important for investors and auditors, and the accounting information quality

loses its value. Similarly, companies with very high levels of earnings management do not allow researchers to move into the field. For these reasons, the practice of the case study is too difficult in this subject.

This study was conducted using the library method. Data were collected using the documents of sample members, i.e., basic financial statements, accompanying explanatory notes, and independent auditor's report on listed companies on the Tehran Stock Exchange during 2013-2017.

A vast literature investigates auditor specialization, investment efficiency and accounting information quality separately. Most of these studies investigate these implications in the developed countries, very little is empirically known about such relation in emerging or transition economies such Iran. Probably in capital markets of Iran information generally are not available to everyone and always one or more of active member in this market about the items traded and companies active in the market have information about them that other member are unaware. Given such a situation in Tehran Stock Exchange and having more information one of parties towards others and having advantage in this relationship can be result that economic system dominating on this market from information perspective is asymmetric. This subject alone shows the lack of information asymmetry that can lead to incorrect selection and moral risk in equity market of Iran as main result of information asymmetry. The circumstances of the partially privatized Iranian audit and capital markets provide a valuable opportunity to examine relation between auditor specialization and accounting information quality.

While Iranian Auditing Standards are largely based on International Auditing Standards, the Iranian audit market is substantially different from those of other emerging economies, including those in the same region. Significant differences arise in both the demand for and the supply of audit services.The Iranian audit market also differs in terms of the Iranian Code of Law as auditors are not exposed to civil litigation risk; their legal liability is limited to criminal prosecution by the State under the Iranian Trade Law and, to date, there are no reported prosecutions. Although the statutory requirements identify shareholders as the intended recipients of audit reports, Iranian law does not provide any civil action against auditors to recover damages. The only significant punishment imposed on auditors are penalties imposed by the IACPA quality control committee or revocation of the audit firm's license as an SEO "trusted auditor" by the peer review audit committee of the SEO.The Securities and Exchange Organization's (SEO) rule restricts the TSE listed firms' auditor choice "SEO' trusted auditors", which includes the IAO. For an IACPA member firm to be a "SEO's trusted auditor", it must meet all the requirements that have been set by the SEO. International accounting firms and their affiliates are still excluded from the Iranian audit market(azizkhani and kavoosi,2017).

The financial statements of the selected companies were obtained from the Codal site and the Rahavard Novin software and then used for the study.

3.2. Variables
3.2.1. Investment efficiency (InvEF)
A proxy was required to investigate the relationship between accounting information quality, the auditor specialization, and investment efficiency, for overinvestment underinvestment. For this purpose, the model proposed by Biddle and Hilary (2009) as follows:

$$\text{Invest}_{it} = \beta_0 + \beta_1 \text{SalesGrowth}_{it-1} + \varepsilon_{it}$$

Where:

Invest donates the investment efficiency expressed by the net increase in total intangible assets.

Sales Growth donates the sales growth and is equal to the change in sales rate of the company i from year t-1 to t-2.

In the final analysis:

Overinvestment (Over): The positive residuals of the investment model multiplied by -1

Underinvestment (Under): The negative residuals of the investment model

3.2.2. Accounting information Quality (AIQ)
Earnings management was used as a measure of information quality to measure accounting information quality. The measure proposed by McNichols and Stubben (2008), who considered voluntary earnings as a proxy for earnings management, was used to estimate accounting information quality.

$$\Delta AR_{it} = \beta 0 + \beta 1 \Delta \text{Sales}_{it} + \varepsilon_{it}$$

Where:

Δ AR_{it} denotes the Annual change rate of accounts receivable for the company i in year t and Δ Sales $_{it}$ denotes the annual change rate of sales revenue for the company i in year t.

3.2.3. Industry specialist auditor (Spau)
The market share approach was used to calculate the auditor industry specialization. The higher the market share calculated for the auditor, the higher the auditor specialization in industry and experience than other competitors. The auditor specialization in the industry is derived from dividing the total assets of all the employers of an audit firm in a particular industry by the total assets of the employers of that industry. The code is one if the auditor has the most clients in the industry, otherwise zero (Balsam et al., 2003). The list of industries active in the stock market was extracted from the Tehran Securities Exchange Technology Management Co website.

3.2.4. Contorol Variables
Company Size (LnSales): The natural logarithm of sales represents the company size.
Company Age (LnAge): The company's age is the natural logarithm of the company's years of establishment from the beginning to the present.
Agility (Tang): The tangible fixed assets to total assets ratio is used to measure this variable.

3.3. Population and sample
The statistical population included all companies listed in Tehran Stock Exchange. Hence, spatial domain of the study was companies listed in Tehran Stock Exchange. Also, temporal domain of the study was the time period 2011-2017. Systematic elimination method was used for sampling and its conditions are defined as below
- Companies with the fiscal year ending March 19 to increase comparability
- Attendance at Tehran Stock Exchange from 2011 t0 2017
- The availability of necessary information about them
- No change in activity and fiscal year, and stoppage during the study period

- Not being among banks, insurance companies, financial and investment institutions, and financial intermediaries

The number of members of this study was equal to 82 companies by applying the above conditions

3.4. Statistical tests
OLS regression was used to test the effect of AIQ and auditor specialization on overinvestment and underinvestment problems:

$$InvEf_{it} = \beta_0 + \beta_1 AIQ_{it} + \beta_2 Spau_{it} + \beta_3 LnSales_{it} + \beta_4 LnAge_{it} + \beta_5 Tang_{i,t} + \varepsilon_{it}$$

Where:
InvEf represents investment efficiency, AIQ represents the quality of accounting information, SPAU is the firms whose auditor is an industry specialist. Since our hypotheses predict that both AIQ and SPAU improve investment efficiency, expected ß1 and ß2 to be positive and significant. The rest are control variables that may influence investment efficiency: sales, age and tangibility.
In this study, the following models were applied to test the moderating effect:

$$Over_{it} = \beta_0 + \beta_1 AIQ_{it} + \beta_2 Spau_{it} + \beta_3 AIQ * SPAU_{it} + \beta_4 LnSales_{it} + \beta A LnAge_{it} + \beta_6 Tang_{it} + \varepsilon_{it}$$
$$Under_{it} = \beta_0 + \beta_1 AIQ_{it} + \beta_2 Spau_{it} + \beta_3 AIQ * SPAU_{it} + \beta_4 LnSales_{it} + \beta A LnAge_{it} + \beta_6 Tang_{it} + \varepsilon_{it}$$

Several tests, such as the Hausman test, autocorrelation, correlation matrix, and heteroscedasticity, had to be performed to determine the panel data quality. Also, the Dickey-Fuller unit root test was used to identify the constant properties of the variables (Chen et al., 2011; Gomariz and Bellesta, 2014).

4. Results
In this study, Excel and Eviews9 software were used to calculate, process, adjust, and analyze data. The hypotheses were tested using Eviews9 software with the help of correlation tests and linear regression.

4.1. Findings

4.1.1. Empirical result

The results of the descriptive statistics of the variables for the whole sample provided in Table 2 represented the descriptive parameters for each variable separately. The results of the table and the coefficients of skewness and kurtosis of the variables indicated that the distribution of variables followed a normal distribution with a slight difference. The significance level of the Jarque–Bera test at the confidence level of 0.95% was 0.066957 for overinvestment and 0.072370 for underinvestment. So both dependent variables followed a normal distribution. The significance level of the Dickey-Fuller statistic for all variables was less than 0.5 at a confidence level of 0.95%. Therefore, the data were reliable.

Table 1. Statistical description of the data

Variables	Overinvestment	Underinvestment	Accounting information quality	Natural logarithm of sales	Natural logarithm of company age	Agility (the tangible fixed assets to total assets ratio)
Abbreviations	OVER	UNDER	AIQ	LNSALES	LNAGE	TANG
Mean	-0.379950	-0.310834	-0.751119	6.034685	1.752917	0.212346
Median	-0.373450	-0.318197	-0.749937	5.971076	1.770852	0.169958
Maximum	-0.002475	-0.007319	-1.018993	8.411369	1.908485	0.824061
Minimum	-0.946823	-0.643596	-3.425275	3.865104	1.491362	0.000817
Standard deviation	0.192301	0.153867	0.285188	0.654734	0.108795	0.159050
Skewness	-0.377935	0.043668	-0.626651	0.447610	-0.458540	1.301468
Kurtosis	2.910423	2.254965	4.612298	4.170026	2.125917	4.798615

4.1.2. Descriptive statistics

In this study, three main hypotheses were developed, each consisting of two sub-hypotheses:

H_1: the investment efficiency of companies with higher accounting information quality is higher.

H_{1a}: the overinvestment problems of companies with higher accounting information quality is lower. The results of testing the first sub-hypothesis are given in Table 2.

According to the results of the table, the hypothesis test model was significant, and there was no autocorrelation problem between the model residuals. Moreover, there was also a significant inverse relationship between independent and dependent variables. As a result, the first sub-hypothesis was confirmed.

H_{1b}: the underinvestment problems of companies with higher accounting information quality is lower. The results of testing the second sub-hypothesis are given in Table 3. According to the results of the table, the hypothesis test model was significant, and there was no autocorrelation problem between the model residuals. Moreover, there was also a significant inverse relationship between independent and dependent variables. As a result, the second sub-hypothesis was confirmed.

Table 2. Results of testing the first sub-hypothesis

Dependent variable: overinvestment				
Variable	Coefficient	Standard deviation	T statistic	Significance level
C	0.038276	0.381892	0.100227	0.9205
AIQ	-6.83E-07	1.75E-07	-3.897742	0.0003
Natural logarithm of sales	-0.063284	0.030053	-2.105730	0.0399
Natural logarithm of company age	0.001941	0.194424	0.009985	0.9921
Agility	0.065912	0.134671	0.489430	0.6265
AR (1)	0.064489	0.126861	0.508341	0.6133
Significance level of F statistic	0.003	Coefficient of determination		0.141
Durbin-Watson statistic	1.798	Adjusted coefficient of determination		0.082

Table 3. Results of testing the second sub-hypothesis

Dependent variable: underinvestment				
Variable	**Coefficient**	**Standard deviation**	**T statistic**	**Significance level**
C	-0.506712	0.218417	-2.319922	0.0216
AIQ	-4.17E-07	1.32E-07	-3.158601	0.0019
Natural logarithm of sales	0.006890	0.016636	0.414152	0.6793
Natural logarithm of company age	0.084480	0.106871	0.790486	0.4304
Agility	0.073767	0.069137	1.066967	0.2875
Significance level of F statistic	0.015	Coefficient of determination		0.036
Durbin-Watson statistic	1.910	Adjusted coefficient of determination		0.020

H_2: the investment efficiency of companies using the services of auditors specializing in the industry is higher.

H_{2a}: the overinvestment problems of companies using the services of auditor specializing in the industry is lower. The results of testing this sub-hypothesis are given in Table 4. According to the results of the table, the hypothesis test model was significant, and there was no autocorrelation problem between the model residuals. Moreover, there was also a significant inverse relationship between independent and dependent variables. As a result, the third sub-hypothesis was confirmed.

H_{2b}: the underinvestment problems of companies using the services of auditor specializing in the industry is lower. The results of testing this sub-hypothesis are given in Table 5. According to the results of the table, the hypothesis test model was significant, and there was no autocorrelation problem between the model residuals. Moreover, there was also a significant inverse relationship between independent and dependent variables. As a result, the fourth sub-hypothesis was confirmed.

H_3: There is a significant relationship between investment efficiency and accounting information quality in companies with specialist auditors.

H_{3a}: there is a significant relationship between the reduction of overinvestment problems and using specialist auditors and IAQ. The results of testing this sub-hypothesis are given in Table 6. According to the results of the table, the hypothesis test model was significant, and there was no autocorrelation problem between the model residuals. Moreover, there was also a significant inverse relationship between independent and dependent variables. As a result, this sub-hypothesis was confirmed.

H_{3b}: there is a significant relationship between the reduction of underinvestment problems and using specialist auditors and IAQ. The results of testing this sub-hypothesis are given in Table 7. According to the results of the table, the hypothesis test model was significant, and there was no autocorrelation problem between the model residuals. Moreover, there was also a significant inverse relationship between independent and dependent variables. As a result, this sub-hypothesis was confirmed.

Table 4. Results of testing the third sub-hypothesis

Dependent variable: overinvestment				
Variable	**Coefficient**	**Standard deviation**	**T statistic**	**Significance level**
C	-0.153582	0.330750	-0.464346	0.6437
Auditor specialization	-0.227090	0.087015	-2.609787	0.0108
Natural logarithm of company age	-0.118726	0.188679	-0.629246	0.5310
Agility	0.185603	0.125938	1.473767	0.1445
AR (1)	0.126738	0.116256	1.090167	0.2789
Significance level of F statistic	0.042	Coefficient of determination		0.109
Durbin-Watson statistic	1.589	Adjusted coefficient of determination		0.064

Table 5. Results of testing the fourth sub-hypothesis

Dependent variable: underinvestment				
Variable	**Coefficient**	**Standard deviation**	**T statistic**	**Significance level**
C	-0.365452	0.153576	-2.379611	0.0182
Auditor specialization	-0.612473	0.102329	-5.985338	0.0000
Natural logarithm of company age	0.045144	0.087895	0.513612	0.6080
Agility	0.099477	0.058927	1.688142	0.0928

Significance level of F statistic	0.000	Coefficient of determination	0.150
Durbin-Watson statistic	1.876	Adjusted coefficient of determination	0.139

Table 6. Results of testing the fifth sub-hypothesis

Dependent variable: overinvestment				
Variable	**Coefficient**	**Standard deviation**	**T statistic**	**Significance level**
C	-0.316714	0.352603	-0.898217	0.3728
AIQ × auditor specialization	-2.14E-06	8.04E-07	-2.666423	0.0099
AIQ	-6.97E-07	1.01E-07	-4.673514	0.0002
Auditor specialization	-0.311257	0.069142	-2.908121	0.0098
Natural logarithm of company age	-0.034070	0.201047	-0.169464	0.8660
Agility	0.175551	0.137472	1.276992	0.2067
AR (1)	0.058721	0.138646	0.423529	0.6735

Significance level of F statistic	0.040	Coefficient of determination	0.268
Durbin-Watson statistic	2.304	Adjusted coefficient of determination	0.200

Table 7. Results of testing the sixth sub-hypothesis

Dependent variable: underinvestment				
Variable	**Coefficient**	**Standard deviation**	**T statistic**	**Significance level**
C	-0.452748	0.187344	-2.416671	0.0167
AIQ × auditor specialization	-8.56E-07	4.00E-07	-2.141806	0.0336
AIQ	-4.49E-07	1.02E-07	-3.743312	0.0011
Auditor specialization	-0.311258	0.001459	-6.001531	0.0000
Natural logarithm of company age	0.073368	0.106873	0.686498	0.4933
Agility	0.084492	0.070391	1.200320	0.2317

Significance level of F statistic	0.049	Coefficient of determination	0.070
Durbin-Watson statistic	2.167	Adjusted coefficient of determination	0.048

5. Discussion and conclusions

In this study, the relationship between accounting information quality and auditor specialization with investment efficiency was examined. Also, the impact of an auditor specialization in the industry on the relationship between accounting information quality and investment efficiency was investigated. In this study, ٣ hypotheses and 6 sub-hypotheses were tested. Results suggested that there was a significant relationship between accounting information quality and overinvestment. The negative sign of the statistic indicated that as accounting information quality increased, overinvestment problems decreased. According to the results, H_{1a} was not rejected by rejecting the H_0 at the confidence level of 95%. The results were consistent with those of studies by Verdi (2006), McNichols and Stubben (2008), Saqafi et al. (2011), and Nilabhra et al. (2013). Results of testing H_{1b} suggested that there was a significant relationship between accounting information quality and underinvestment. The negative sign of the statistic

indicated that as accounting information quality increased, underinvestment problems decreased. According to the results, H_{2a} was not rejected by rejecting the H0 at the confidence level of 95%. The results were in line with those of studies by and Verdi (2006) and Elaoud and Jarboui (2017). Results of testing the H_{2a} that there was a significant relationship between auditor specialization and overinvestment. The negative sign of the statistic indicated that as auditor specialization increased, overinvestment problems decreased. According to the results, the H_{2b} was not rejected by rejecting the H0 at the confidence level of 95%. The results were consistent with those of studies by Lai (2009), Chang et al. (2009), and Mary and Bing (2012). Results of testing the H_{2b} suggested that there was a significant relationship between auditor specialization and underinvestment. The negative sign of the statistic indicated that as auditor specialization increased, underinvestment problems decreased. According to the results, the H_{2b} hypothesis was not rejected by rejecting the H_0 at the confidence level of 95%. The results were in line with those of studies by Stanley and DeZoort (2007), Chang et al. (2009), Sun and Liu (2011), and Darabi et al. (2016).

Results of testing the H_{3a} hypothesis suggested that there was a significant relationship between accounting information quality and overinvestment with the presence of an auditor specializing in the industry. The negative sign of the statistic indicated that as accounting information quality increased, overinvestment problems decreased in the case of the presence of an auditor specializing in the industry. According to the results, H_{3a} hypothesis was not rejected by rejecting the H_0 at the confidence level of 95%. This hypothesis was compared with the H_{1b} regarding the moderating role of auditor specialization. In the first hypothesis, it was observed that there was a significant inverse relationship between accounting information quality and overinvestment. In the H_{1b}, the t-test statistic value for the variable of accounting information quality increased compared to the first hypothesis in the case of the presence of a specialist auditor as a moderator, indicating that there was a more significant relationship between accounting information quality and overinvestment problems with the presence of an auditor specializing in the industry. Given the coefficients of determination, the significance of this relationship increased slightly, and the auditor specialization was able to moderate this

relationship at a low level. The results were in agreement with those of studies by Habib et al. (2005), Biddle and Hilary (2006), and Robu and Robu (2015). Finally, the results of testing the H_{3b} hypothesis suggested that there was a significant relationship between accounting information quality and underinvestment with the presence of an auditor specializing in the industry. The negative sign of the statistic indicated that as accounting information quality increased, overinvestment problems decreased in the case of the presence of an auditor specializing in the industry. According to the results, the H_{3b} hypothesis was not rejected by rejecting the H0 at the confidence level of 95%. This hypothesis was compared with the second H_{2b} regarding the moderating role of auditor specialization. In the H_{2b} it was observed that there was a significant inverse relationship between accounting information quality and underinvestment. In the H_{3b}, the t-test statistic value for the variable of accounting information quality increased compared to the second hypothesis in the case of the presence of a specialist auditor as a moderator, indicating that there was a more significant relationship between accounting information quality and underinvestment problems with the presence of an auditor specializing in the industry. Given the coefficients of determination, the significance of this relationship increased slightly, and the auditor specialization was able to moderate this relationship at a low level. The results were consistent with those of studies by Verdi (2006), Gomariz and Bellesta (2014), Elaoud and Jarboui (2017), and Blandon and Bosch (2018).

6. Conclusion

Due to limited resources and the need of companies to plan to prevent a recession and backwardness, increase investment efficiency in addition to the development of investment is of great importance. By increasing the transparency of accounting information and reducing the information asymmetry between managers and investors and creating solutions to reduce the unequal distribution of information between consumer groups and companies, information becomes publicly available. In the condition of transparency of information environment, the possibility of incorrect selection and non-optimal decisions of managers in carrying out investment projects is reduced and finally investment efficiency

improves. The results of testing the hypotheses indicated that accounting information quality could significantly contribute to the improvement of investment efficiency. Additionally, higher accounting information quality was able to reduce overinvestment and underinvestment problems. Therefore, this study provides further evidence on the usefulness of accounting information in the field of investment. These findings may encourage information providers to provide information with better quality to respond appropriately to the needs of users and encourage accounting information users to pay attention to the importance of accounting information.

Related studies (Biddle et al., 2009; Chen et al., 2011; Gomariz and Bellesta, 2014) confirm these results and placed great emphasis on the role of auditors in reducing information asymmetry, suggesting that the auditor specialization could be used as a mechanism to reduce information asymmetry and agency costs. Hiring an auditor specializing in the industry could guarantee accounting information quality. Companies with an auditor specializing in the industry were more likely to provide expected information on future cash flows with more certainty than those with non-specialist auditors. According to empirical estimates, the auditor specialization reduced overinvestment and underinvestment problems. As expected, there was a positive relationship between accounting information quality and investment efficiency if there was a specialist auditor. The coefficients of this variable indicated that accounting information quality could reduce overinvestment and underinvestment problems of companies hiring an auditor specializing in the industry. In other words, the higher accounting information quality required the use of a specialist auditor for stronger supervision and higher responsibility. Moreover, the results of moderation models suggested that a skilled auditor with specific experience in a particular sector could provide more reliable information and that the auditor's specific knowledge would help build higher capacity to identify physical distortions and limit the optional behavior of management. This meant that accounting information quality in companies with auditors specializing in the industry was effective in reducing overestimated and underinvestment problems.

The achieved results are exclusively limited to findings from the sample, which includes only industrial companies in Iran, for this reason the sample of 82 firms could be considered small. Despite such limits, the study results may be potentially useful for shareholders, investors, managers and policy makers to help in further enhancing firms' investment efficiency. According to the findings and results of this study and also theoretical framework described, suggestions are as follows:

1) It is recommended to the managers and officials of the Securities and Exchange Organization, in order to reduce information asymmetry and improve investor efficiency, practical solutions be ahead and have more control over the quality of auditing and also to reduce conflict benefits require institutions to pay close attention to audit reporting and accreditation of financial reports.

2) Investors are advised to pay attention to work experience of the auditor of investee companies in order to achieve greater returns on investment. Announcing a score for the auditor's expertise in any industry can also be helpful.

The following are suggested for future research:

1) Given that the auditor's specialization to reduce information asymmetry between various stakeholders, suggesting a study of the relationship between information asymmetry and investment efficiency.

2) Measuring the accounting information quality with other indicators and repeating this research.

3) Given that management decisions play an important role in the efficiency and inefficiency of investment, therefore, it is suggested that there be a relationship between CEO's ability and efficiency investment studies should be done.

4) Doing this research in the capital markets of other countries and comparing the results with this research is another suggestion for future research.

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