



The Relationship between Management Ability and Audit Fees by Considering Firm Credit and Auditor's Dependency during Financial Crises

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Abstract

This paper aims to assess the relationship between management ability and audit fees by considering firm credit and auditor's dependency during the financial crisis. Despite the presence of extensive studies on determining factors in audit fees, most of the studies have been concentrated on determining factors at the firm level, and little evidence is available to auditors on the information content of special managerial features. This paper aims to examine the relationship between managerial abilities and audit fees by considering firms' financial crisis conditions.

In this paper, management abilities are considered to form three firm size indices, the firm's sales share in the market and cash. Moreover, the standard deviation of 3-year sales is used for firm credit, and an abnormal audit fee is employed for calculating auditor dependency. For this purpose, a total number of 91 listed firms on the Tehran Stock Exchange is evaluated for 6 years between 2014 and 2019. The panel regression model is used for hypothesis testing, and Chow and Hausman's tests are used for selecting the appropriate model-fitting method. The VIF test is used for analyzing linearity among explanatory variables. The obtained results indicate that financial crisis conditions contribute to the relationship between management abilities (based on firm size measurement) and audit fees. Further, the results indicate the negative impact of firm credit on the relationship between audit fee and management ability (based on cash). According to the results, audit fee dependency on the relationship between management ability (based on measurement, the firm's sales share, and cash) and audit fee is positive. Moreover, the results suggest that financial crisis conditions contribute to firm credit effectiveness in the relationship between management ability and audit fees.

In past research, some factors affecting the auditor fee are debts, management ability, and auditor independence. In this paper, we contribute to the financial crisis as a variable that influences some of these relationships. And we show that relationships make sense by considering this variable.

Keywords: Audit fee, Firm Credit, Auditor Dependency, Financial Crisis, Management Ability

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1. Introduction

Studying the contributing factors to audit fees is important in terms of their effect on audit quality and auditor dependency. Carcello et al. (2002) declare that audit fee reflects the economic costs of efficient auditors and also claim that from auditors' point of view, they attempt to minimize total costs by balancing the costs of their resources (costs for performing more audit) and the future losses derived from legal liabilities. More audit attempts to lower the risk of auditors' debt losses, and the auditor presents that proportion of the audit process that minimizes total costs. Audit fee contributes to sound planning and implementation of financial auditing. Bozorg-asl (2009) believes that the audit fee is reflective of audit quality for financial statement users. Independent auditing is a significant proportion of the financial reporting system. The report of independent auditors can elucidate the fulfillment of management commitments to investors. Audit fees can be considered a fee incurred by the employer for fulfilling the commitments. Audit fee relies on different factors, the amount of significance of which is different in different countries. One of the audit profession's major challenges is determining the lowest range and rate drop of some audit firms. Considering auditing, however, as homogeneous goods and its non-competitive pricing will jeopardize the independence and quality of audit services. Furthermore, it is worth mentioning that independent auditing is the cornerstone of economic transparency, people's trust in the capital market, and government responsiveness to the people, so it should not be considered a product or general service (Bozorg-asl, 2009). Low audit quality causes the decline of trust of financial statement users, and this will not only lead to failure in achieving audit goals, but to the decline of the credibility of the audit process at larger scales, prevents the optimum allocation of capital in the Securities market, and increase the capital cost and financial supply. Auditing business units' financial statements aim to voice a technical opinion about financial statements' desirability from all significant aspects. Such an opinion is a professional judgment that always deals with audit risk (Hnifeh and Mahmoodi, 2009). According to credibility assumption, the audit profession may claim irresponsibility about financial statements' information content. Still, investors believe that if they suffer a loss due to using deviated financial statements, auditors are responsible and should compensate (Simonic, 1980). In this regard, the amount of receivable fee and the adjustment of audit report due to ambiguity in the continuity of an employer's activity can be among the strategies for covering audit operation risk (Krishnan & Wang, 2015). Auditors should be informed about the approach and executive management method when evaluating the audit risk according to audit standards. To identify and estimate the audit risk, appropriate evaluation of the firm's overall condition is a matter of great importance (COSO, 2013). Auditors should collect more evidence for lowering the risk of failure in exploring significant distortions, leading to an increase in audit costs (Krishnan et al., 2012). Moreover, senior managers' characteristics will be considered for audit admission and planning (Kizirian et al., 2005; Johnson et al., 2013; Krishnan & Wang, 2015, Gerakos et al., 2015). Santanu et al. (2018) declare that firms with more powerful management incur lower audit services costs. Firm management by leaving a direct effect on the general policies plays an important role in the quality and credit of presented information in financial reports and case of the weak performance of the management, the continuity of firm activities may face uncertainty, and this would lead to the adjustment of the audit opinion. Besides, more competent managers are expected to act more wisely in selecting auditors and determining the audit fee and causes the decline of this factor. Previous studies show that more competent management has a positive impact on the results of financial reports (Bamber, Jiang, & Wang, 2010; Dyreng, Hanlon, & Maydew, 2010; Mutsoma & Zhang, 2011). Higher management abilities can increase financial information quality (Demerjian, Lev, Lewis, & McVay, 2013). Further,

a higher management ability can lower the audit fee since it declines the audit risk and leads to a high quality of financial information (Krishnan & Wang, 2015). In the accounting literature, managers' ability is one of the dimensions of firms' human capital classified as intangible assets. For example, Demerjian et al. (2012) define management ability as managers' efficiency, compared to rivals, in converting firm resources to income. Such income generation resources include inventory price, office, distribution, sales costs, fixed assets, operational rents, research and development costs, and the firm's intangible assets (Demerjian et al., 2012).

Higher managerial abilities can bring about more efficient management of daily firm operations, especially in critical periods of operation, when managerial decisions can contribute greatly to firm performance. Besides, in critical periods, more efficient managers require more appropriate decisions for supplying resources (Andreou et al., 2016). A more worthwhile investment in more valuable projects and efficient management of the staff is also among competent managers' characteristics. Hence, in the short run, the management is expected to generate more income using a certain level of resources or earn a certain level of income using lower resources (Demerjian et al., 2012). In contrast, weak decisions and lower management expertise in leadership can direct the firm toward bankruptcy. Moreover, more competent managers enjoy more knowledge and awareness about customers and macroeconomic conditions. They can better understand more complicated standards and implement them correctly (Demerjian et al., 2012). Yuan et al. (2019) claim that when managerial ownership level conforms with the interests of shareholders (e.g., "alignment of interests"), the relationship between managerial ownership and audit firm size and audit costs is negative. On the other hand, when managerial ownership level is in contrast to shareholders' interests (conflict of interests), the relationship is positive. Huang and Sun (2017) posit that high competent Managers lower real earnings management and managers with higher abilities will remarkably reduce real earnings management's effect on firm performance. Most of the opinion leaders (Greening & Johnson, 1996; Gitman, 1998; Lensberg et al., 2006; Newton, 2010) also believe that management weakness and inability are among the major contributing factors to the financial crisis of firms.

Related literature to bankruptcy prediction and financial distress is about a series of related studies, wherein financial distress has little difference. In some studies, the final limit in financial distress means bankruptcy, and, in some studies, other criteria are considered for some paragraphs of the audit report.

Those factors that lead to a firm's bankruptcy do not emerge in a flash, and the financial crisis signs appear earlier than the final bankruptcy. A financial crisis is when the firm is in trouble acquiring sufficient financial resources for continuing the operation and daily affairs (Beaver, 1966; Pastena & Ruland, 1986). In this situation, the firm cannot generate sufficient cash for meeting the needs, including paying back the creditors (Jantadej, 2006). The financial literature emphasizes that firms enter the financial crisis cycle years before the emergence of bankruptcy, and different economic events occur before the bankruptcy.

2. Literature Review and Hypothesis Development

Recent studies show that the audit fee is associated with compensation plans for managers. These plans cause a change in risk-taking (Kannan et al., 2014; Kim et al., 2014). Topical literature reveals that a positive relationship exists between some of the risk concepts and audit fees. Hence, auditors consider their employers' risk features when determining the audit fee and compensate for the related risks via a higher audit fee. Moreover, the results suggest that auditors should not focus only on risk related to financial statements but should have a wider overview of the employer's commercial

behavior (Bedard & Johnson, 2001). The growing literature related to determining factors in audit pricing proved that audit fee is associated with risk factors related to employer's characteristics, including size and complication of the employer (Simunic, 1980; Francis, 1984; Palmrose, 1986), internal control quality (Hoag & Hollingsworth, 2011), commercial risk (Bentley et al., 2013), and corporate governance (Xingze, 2012). A bunch of evidence also demonstrates that the audit fee is more sensitive to risk factors after providing the Sarbanes-Oxley Act. Few studies, however, carried out on how auditors respond to risk factors related to senior management of their employers. Chen et al. (2013) argue that auditors ask for higher fees from firms with risk-taking managers. Krishnan and Wang (2015) develop the previous studies and assess whether auditors respond to risk factors related to employer managers or not and conclude that managers' ability significantly affects audit services pricing. The audit fee is determined based on the auditor's estimated risk from the employer, competition in the audit market, and negotiations between auditor and employer.

Krishnan and Wang (2015) analyze the effect of management ability on audit fees and notice that firms with more competent managers pay lower audit fees. The study of Bills et al. (2015) indicates that an audit firm size has a negative and significant impact on the relationship between management ability and audit fee. Moreover, their study results show that management uncertainty has a positive and significant effect on audit fees. Chen et al. (2015) conclude that auditors estimate higher risks when the managers are highly motivated to keep or increase the stock price. In other words, auditors ask for higher payments from firms with executive managers who are more sensitive to stock return fluctuations. Duellman et al. (2015) illustrate that firms with overconfident managers pay lower audit fees. They also figure out that overconfident managers are less likely to hire industry specialized auditors. Lauck et al. (2014) argue that the new CEO often makes major changes, in the beginning, to change the outlook and strategy of the firm and have an influence in financial and operational reporting and decision-making. They declare that the firm CEO contributes significantly to the audit fee. Johnson et al. (2013) observe a positive and significant relationship between overconfidence of management and audit risk estimation, so in case the auditor detects this personality characteristic of managers and overestimates financial reporting risk due to overconfidence of managers, he can ask for higher payment to be able to pursue his audit measures which are decreasing the risk of detection and significant distortion. Andreou et al. (2013) assess the relationship between management ability and firm performance during the financial crisis in 2008. By evaluating the data related to 2344 firms during 2008-2011, they conclude that management ability is directly associated with firm performance, and during the crisis in 2008, more competent managers, compared with those with lower competency, have managed the firm resources, liabilities, and capital expenditures more efficiently. Garcia et al. (2014) reveal that the less the volatility of firm profit and the smoother with predictability, the higher the commercial credit. In other words, an increase in earnings quality would lead to an increase in credit. Fernando and Molir (2012) show that commercial credit utilization is higher in less-developed countries.

Several conducted studies show a significant relationship between management abilities and the amount of audit fees (Krishnan & Wang, 2015; Duellman et al., 2015). By considering the previous studies on internal setting and credit of the firm and their impact on the relationship between management abilities and audit fee, critical conditions and firm reputation probably contribute to management and auditors' abilities in determining audit fee, so the first three hypotheses of the study are as follows:

H1: financial crisis conditions contribute to the relationship between management ability and audit fee.

H2: firm credit contributes to the relationship between management ability and audit fee.

H3: financial crisis conditions contribute to firm credit on the relationship between management ability and audit fee.

New York Securities and Exchange Commission (2002) declares that in case the payment of an auditor accounts for more than 15% of the total revenue of a firm, the independence of that firm may be under question because it is probable that the dependence of the audit firm on the employer or special employers becomes extremely high. Auditor dependency means the audit firm should set the audit report following employer management's opinion to survive in the market of audit services. Each audit firm's portfolio comprises employers, each of which has a special but different significance. Such a sign is more evident in today's competitive world, and auditors or audit firms attempt to keep their employer. Heavy dependence on an employer threatens personal benefit and can be seriously detrimental to auditor independence. Auditing financial statements can create economic added value for the firm. By considering the significance of audit services and the impossibility of direct observation of audit quality, finding an effective method for controlling audit quality is vital (Ghosh et al., 2005). Audit fees can be considered significant aspects of audit quality management and control because the basic condition for ensuring the quality of audit services is the payment. When auditors ask for a fee extremely higher than the presented services' final price, society would doubt their work quality. From the investors' point of view, there is a negative and significant relationship between employer's significance and auditor independence. The employer's higher significance for the auditor lowers investors' viewpoint about auditor independence (Ghosh et al., 2005). Choi et al. (2010) demonstrate that abnormal positive audit fee is associated positively with discretionary accruals. Creosol et al. (2002) posit that a dependent audit fee can contribute to auditor independence. Kinney and Libby (2002) claim that abnormal audit fees, compared to normal audit fees, can be better attributed to the employer in the form of rent or economic bribes related to audit services or the auditor's economic dependency on the employer. One of the issues affecting the audit fee and the audit quality is the auditor's economic dependency. Asthana and Boone (2012) and Blankley (2014) declare that economic dependency between auditor and employer leads to a condition where auditors' willingness to exert professional care and unbiased judgment on collected evidence will decline considerably. In the following, we assess auditor dependency on audit fees and the effect on management ability and audit fee.

H4: auditor dependency on audit fees contributes to the relationship between management ability and audit fee.

Several studies have assessed the motives of earnings management in accounting and finance. Studies on the effect of financial motives of earnings management, including low profitability and high leverage (Latridis & Latridis, 2009) have proved earnings manipulation to avoid the decline or concealing losses in firms (Ayers et al., 2006) and most of the similar topics have also been assessed on internal factors of a firm. In contrast to the internal features that lead to earnings manipulation and management, numerous events outside the firm can also be among financial reporting quality drop motives. In the previous studies, the commercial cycle's effect (Strobl, 2013; Li et al., 2013) and periodic economic volatilities (Li et al., 2013, Agarwal et al., 2007) are substantiated on the earnings management. These studies show that earnings quality and financial reporting quality are extremely sensitive to adverse economic conditions, and financial crises can contribute to financial reporting policies. One of the factors outside the firm, the effect of which is analyzed on financial reporting quality, is the financial crisis (Persakis & Latdidis, 2015).

In critical conditions, firm managers are aware of financial reporting on users' understanding of the firm's financial status and operational performance. Such an effect has raised whether critical conditions strongly motivate the firm managers to improve financial reporting quality to attract investors' trust (Arthur et al., 2015). The answer to this question will explain firms' financial reporting strategies, recognize the behaviors and motives during the crisis, and detect accounting policies used by the managers to survive. Hence, it is probable that the financial crisis influences auditor dependency and management ability, so the following hypothesis is formulated:

H5: financial crisis conditions contribute to auditor dependency on the relationship between management ability and audit fee.

3. Research methodology

This paper is practical, in terms of objective, descriptive-correlational, method, and longitudinal, in terms of time horizon. Since the data used are real and historical, the study can be classified among the retrospective studies.

The study's statistical population includes listed firms on the Tehran Stock Exchange from all industries during 2014-2019. The number of samples of this paper is 91 firms, indicating the real statistical population.

To collect data related to the experimental section and to examine research hypotheses of related data to dependent, independent, and control variables, the audited financial statements of listed firms on Tehran Stock Exchange are gathered from <http://www.Codal.ir> (comprehensive information databased of publishers), <http://www.sahamyab.com>, <http://www.tse.ir>, and other resources using the information bank of Tehran Stock Exchange (Iran bourse, Tadbir Pardaz, and Rah Avard Novin Software).

3.1. Descriptive statistics

The following table shows the obtained descriptive findings from this paper, including mean, median, standard deviation, minimum and maximum observations. It is worth mentioning that the total number of firms understudy is 91, collected during 6 consecutive years.

According to the obtained results from reported descriptive statistics in Table 1 and 2, the lowest payment to auditors is almost 4, and the highest payment is about 10. On average, 4% of firm assets in the population of the study is cash. The highest amount of debt for firms understudy is 1.8 times more than their assets. Moreover, 55% of firms received conditional, rejected, or no opinion from their auditors. According to the bankruptcy measurement function, 6% of the population is in critical condition.

3.2. Inferential statistics

3.2.1. Measuring the variable of auditor dependency (abnormal fee)

The abnormal audit fee is achieved from the residual of the following regression model. To calculate audit fee residual, following Zigia and Zi (2017), the presented regression model of Francis and Wang (2005) is used as follows:

Model (1)

$$\text{LAF} = \beta_0 + \beta_1\text{LTA} + \beta_2\text{CATA} + \beta_3\text{QUICK} + \beta_4\text{LEV} + \beta_5\text{ROA} + \beta_6\text{LAGOP} + \beta_7\text{LOSS} + \beta_8\text{SPECIALIST} + \beta_9\text{BIG} + \beta_{10}\text{SWITCH} + \varepsilon$$

Table 1. Descriptive statistics

Variables	Year-firm	Sign	Mean	Median	Std. dev.	Minn.	Max.
Audit fee logarithm	546	Ln AF	6.788	6.771	0.904	3.784	9.903
Management ability (firm size)	546	MGR ABILITY1	13.713	13.690	1.528	9.250	19.190
Management ability (sales portion of the firm)	546	MGR ABILITY2	0.010	0.009	0.019	>0.001	0.801
Management ability (cash)	546	MGR ABILITY3	0.042	0.023	0.057	0.001	0.460
Firm credit	546	credit	11.665	11.739	1.811	0.347	17.196
Auditor dependency	546	dependent	0.009	0.014	0.389	-1.861	1.630
Inventory and accounts receivable to total assets	546	INVREC	0.530	0.525	0.200	0.010	0.900
Return on assets	546	ROA	0.061	0.070	0.192	-0.790	0.740
Financial leverage	546	LEV	0.671	0.660	0.305	0.070	1.880
Current assets except inventory to current debts	546	QUICK	0.901	0.760	0.767	0.010	8.390
Sales growth	546	SGROWTH	0.165	0.110	0.522	-1.000	4.420
Tenure	546	ATENURE	3.298	2.000	3.623	1.000	23.000
Institutional ownership	546	INSTO	0.311	0.220	0.302	0.000	0.960

Table 2. Frequency of the dummy variables

Variable	Sign	1		0		Total	
		Frequ ency	Frequ ency percentag e	Frequenc y	Frequenc y percentag e	Frequenc y	Frequenc y percentag e
Firm loss	LOSS	126	23	420	77	546	546
Audit organization	BIG	138	25	408	75	546	546
Financial crisis criterion	DIST RS	31	6	515	94	546	546
Unacceptable opinion	AOPIN ION	301	55	245	45	546	546

Model residual is calculated by placing the obtained regression coefficients from model fitting reported in the above table in the model.

$$LAF = 0.304 + 0.439 * LTA + 0.453 * CATA + 0.054 * QUICK + 0.045 * LEV + 0.419 * ROA + 0.001 * LAGOP + 0.016 * LOSS + 0.095 * SPECIALIST + 0.203 * BIG + 0.014 * SWITCH + \varepsilon$$

It is worth mentioning that the above equation will be calculated for each year-company to have 546 observations.

Given the above-fitted model, the regression model residual from the above equation indicates auditor dependency on audit fees. The following related models to hypothesis testing will be analyzed.

Table 3. Results of model fitting for the variable of auditor dependency

Variables	Sign	Regression coefficients	Std. dev.	T-statistic	p-value
Fixed value	β	0.304	0.365	0.835	0.404
Total assets logarithm	<i>LTA</i>	0.439	0.025	17.896	>0.001**
Current assets to total assets ratio	<i>CATA</i>	0.453	0.120	3.787	>0.001**
Current assets except for inventory to current debts	<i>QUICK</i>	0.054	0.035	1.572	0.117
Financial leverage	<i>LEV</i>	0.045	0.079	0.571	0.568
Return on assets	<i>ROA</i>	-0.419	0.098	-4.281	>0.001**
Conditional opinion	<i>LAGOP</i>	0.001	0.022	0.059	0.953
Loss	<i>LOSS</i>	0.016	0.034	0.466	0.641
Rank A audit firms	<i>SPECIALIST</i>	0.095	0.029	3.334	0.001
Audit organization	<i>BIG</i>	0.203	0.049	4.153	>0.001**
Auditor change	<i>SWITCH</i>	0.014	0.020	0.728	0.467
Coefficient of determination	0.878	F statistic of the model		27.023	
The adjusted coefficient of determination	0.847	The significance level of regression		0.000	

3.3. Hypothesis testing

The regression model of Ferdinand et al. (2018) is used for hypothesis testing as follows:

$$\ln AF = \beta_0 + \beta_1 \text{MGR ABILITY} + \beta_2 \text{DISTRs} + \beta_3 \text{MGR ABILITY} * \text{DISTRs} + \beta_4 \text{credit} + \beta_5 \text{dependent} + \beta_6 \text{MGR ABILITY} * \text{credit} + \beta_7 \text{MGR ABILITY} * \text{dependent} + \beta_8 \text{MGR ABILITY} * \text{DISTRs} * \text{credit} + \beta_9 \text{MGR ABILITY} * \text{DISTRs} * \text{dependent} + \beta_{10} \ln \text{SIZE} + \beta_{11} \text{INVREC} + \beta_{12} \text{ROA} + \beta_{13} \text{LOSS} + \beta_{14} \text{LEV} + \beta_{15} \text{QUICK} + \beta_{16} \text{SGROWTH} + \beta_{17} \text{BIG} + \beta_{18} \text{ATENURE} + \beta_{19} \text{AOPINION} + \beta_{20} \text{INSTO} + \varepsilon$$

Since three measurement methods are considered for the variable of management ability, to better show the regression results due to an excessive number of related variables, each measurement method is put in the model separately, and the model has fitted three times.

Regarding the reported results in Table 4, the variables of management ability, auditor dependency, comparing management ability with the financial crisis, financial crisis, and firm credit, inventory and accounts receivable to total assets, loss, financial leverage, current assets except for inventory to current debts, and audit organization have a positive and significant association with the audit fee. On the other hand, the financial crisis variables, comparing management ability in financial crisis and return on assets, negatively and significantly affect the audit fee. Other fitted variables in the model have no relationship with the dependent variable of the model.

Given the reported results in Table 5, the variables of auditor dependency and comparing management ability and audit dependency have a positive and significant association with the audit fee. On the other hand, the financial crisis variable has a negative and significant relationship with the audit fee.

Table 4. Results of model fitting related to research hypotheses (management ability criterion: firm size)

Variables	Sign	Regression coefficients	Std. dev.	T statistic	p-value
Fixed value	β	1.328	0.182	7.317	>0.001**
Management ability (firm size)	MGRABILITY1	0.380	0.013	28.252	>0.001**
Financial crisis	DISTRS	-0.301	0.134	-2.249	0.025
Comparing management ability with the financial crisis	MGRABILITYDISTRS	-0.046	0.016	-2.901	0.004
Firm credit	CREDIT	-0.031	0.015	-2.035	0.143
Audit dependency	DEPENDENT	1.001	0.003	28.787	>0.001**
Comparing management ability with firm credit	MGRABILITYCREDIT	0.002	0.002	1.903	0.058
Comparing management ability with auditor dependency	MGRABILITYDEPENDENT	0.001	0.001	1.259	0.209
Comparing management ability, financial crisis, with firm credit	MGRABILITYDISTRSCREDIT	0.002	0.001	3.173	0.002
Comparing management ability, financial crisis, with auditor dependency	MGRABILITYDISTRSDEPENDE	0.002	0.002	1.309	0.192
Inventory and accounts receivable to total assets	INVREC	0.173	0.014	12.220	>0.001**
Return on assets	ROA	0.338-	0.017	-20.151	>0.001**
Loss	LOSS	0.017	0.005	3.660	>0.001**
Financial leverage	LEV	0.122	0.014	9.005	>0.001**
Current assets except for inventory to current debts	QUICK	0.080	0.005	16.367	>0.001**
Sales growth	SGROWTH	0.001	0.004	0.163	0.870
Audit organization	BIG	0.114	0.007	16.199	>0.001**
Tenure	ATENURE	0.001	0.001	1.043	0.298
Unacceptable opinion	AOPINION	0.003	0.004	0.755	0.451
Institutional ownership	INSTO	-0.008	0.015	-0.504	0.615
Coefficient of determination	0.71	F statistic of the model		62.305	
The adjusted coefficient of determination	0.68	The significance level of regression		0.000	

Table 5. Results of model fitting related to research hypotheses (management ability criterion: sales share of the firm from the total market)

Variables	Sign	Regression coefficient	Std. dev.	T statistic	p-value
Fixed value	β	1.072	0.104	10.331	>0.001* *
Management ability (sales share)	MGRABILITY2	-0.427	0.938	-0.455	0.649
Financial crisis	DISTRS	-0.019	0.020	-0.949	0.034
Comparing management ability with the financial crisis	MGRABILITYDISTRS	-68.268	0.140	-1.238	0.216
Firm credit	CREDIT	-0.003	0.003	-1.045	0.296
Audit dependency	DEPENDENT	0.996	0.005	19.536	>0.001* *
Comparing management ability with firm credit	MGRABILITYCREDIT	0.043	0.075	0.581	0.562
Comparing management ability with auditor dependency	MGRABILITYDEPENDENT	0.317	0.080	3.958	>0.001* *
Comparing management ability, financial crisis, with firm credit	MGRABILITYDISTRSCREDIT	3.677	4.642	0.792	0.428
Comparing management ability, financial crisis, with auditor dependency	MGRABILITYDISTRSDEPENDENT	11.589	41.157	0.282	0.778
Coefficient of determination	0.41	F statistic of the model		13.632	
The adjusted coefficient of determination	0.32	The significance level of regression		0.000	

Table 6. Results of model fitting related to research hypotheses (management ability criterion: cash)

Variables	Sign	Regression coefficient	Std. dev.	T statistic	p-value
Fixed value	β	0.975	0.063	15.507	>0.001**
Management ability (cash)	MGRABILITY3	1.216	0.307	3.961	>0.001**
Financial crisis	DISTRS	-0.043	0.015	-2.968	0.003
Comparing management ability with the financial crisis	MGRABILITYDISTRS	1.559	1.176	1.326	0.186
Firm credit	CREDIT	-0.002	0.002	0.943	0.346
Audit dependency	DEPENDENT	0.998	0.003	31.288	>0.001**
Comparing management ability with firm credit	MGRABILITYCREDIT	-0.088	0.027	-3.314	0.001
Comparing management ability with auditor dependency	MGRABILITYDEPENDENT	0.095	0.045	2.123	0.034
Comparing management ability, financial crisis, with firm credit	MGRABILITYDISTRS CREDIT	-0.066	0.083	-0.803	0.422
Comparing management ability, financial crisis, with auditor dependency	MGRABILITYDISTRS DEPENDENT	-0.062	0.316	-0.197	0.844
Coefficient of determination	0.31	F statistic of the model		51.93	
The adjusted coefficient of determination	0.29	The significance level of regression		0.000	

Given the reported results in Table 6, the variables of management ability, auditor dependency, and comparing management ability with auditor dependency have a positive and significant relationship with the audit fee. On the other hand, the financial crisis variables, comparing management ability, and firm credit have a negative and significant relationship with the audit fee.

4. Conclusion and discussion

Three criteria are used and examined for calculating the variable of management ability. The statistical results show that the financial crisis has a negative impact on the relationship between management ability (criterion for computing firm size) and audit fee. Given the obtained results from statistical analyses, the financial crisis has a reduction effect on the relationship between audit fee and firm size. This means larger firms benefit

from a more reduction effect on the financial crisis. Besides, results indicate that the financial crisis does not affect the relationship between cash and sales share and audit fee. Further, the financial crisis directly correlates with firm credit on the relationship between management ability and audit fees.

Auditors determine their payment by estimating the employer's amount of risk and asking for a higher audit fee from employers with risk-taking managers (Chen et al., 2015). The present study results show that the audit fee will enhance by increasing the management ability and that such a result conforms with Krishnan and Wang's (2015) study. They declare that there is a significant relationship between management ability and audit fees. The study results indicate the declining effect of the financial crisis on this relationship, reducing managers' risk-taking power in critical conditions. Among other reasons, we can refer to management weakness as one of the principal reasons for the financial crisis (Grinin and Johnson, 1996; Gitman, 1998; Lessenberg et al., 2006; Newton, 2010), underestimation of auditors, and suggesting lower fees. According to this paper's results, we recommend the investors and other users of financial statements to mind the amount of audit fee since this figure indicates some of the estimations and behavioral recognitions of managers of that firm. In this paper, the results indicate the negative effect of firm credit on the relationship between management ability (criterion for cash calculation) and audit fee. The obtained results suggest that firm credit has a reduction effect on the relationship between cash and audit fee: the more renowned the firm, the less the relationship between these two variables. However, the relationship between firm size and sales share and audit fee is independent of firm credit. One of the factors that have the highest risk for firms is the cash holding by firms. Firms that hold more cash, on the one hand, have the chance of optimal investments for increasing the interests of shareholders and, on the other hand, pave the way for the opportunistic behavior of managers. Hence, auditors make more attempts to prevent probable lawsuit damages and consequently ask for higher fees. The results of this paper are indicative of a positive and significant association between cash and audit fee. Firms with sufficient credit are expected to hold less cash and not exploit the firm credit as a tool in their deals, so the amount of auditor attempt will be lower, and less audit fee would be inquired.

The statistical analysis results also show that auditor dependency directly impacts the relationship between management ability (criterion for calculating sales share and cash) and audit fee. Auditor dependency has a positive effect on audit fees, which means the more the auditor's dependency on audit fees, the stronger the relationship between cash and firm sales and vice versa. Firm size and audit fee have a relationship independent of auditor dependency and audit fee. On the other hand, results show that financial crisis conditions have no role in auditor dependency on the relationship between management ability and audit fee.

There have been some challenges and obstacles, out of control of the researcher, in conducting the study. The followings are some of the limitations of the study:

As for the payable fees to the auditor, all firms do not disclose separately, and this problem would lead to the reduction of the number of sample firms,

Auditors' fees are disclosed entirely by the firms, so the presented audit fees in this paper include the sum of paid fees to auditors, involving accommodation, hosting, etc.

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Appendix:

The method for measuring the variables of the study:

LnAF: natural logarithm of audit fees

MGR ABILITY: several items assigned to this variable

Firm size, 2- market share of the firm, 3- firm cash

DISTR: 0 and 1 Variable that according to the presented bankruptcy model of Ohelson et al. (1980), the chance of bankruptcy of the firm is at least 50% 1, otherwise, 0.

Equation (1)

$$P' = (1/1 + e^{-\Psi}) * \Psi = -1.32 - 0.407 * SIZE + 6.03 * TLTA - 1.43 * WCTA + 0.0757 * CLCA - 2.37 * NITA - 1.83 * FUTL + 0.285 * INTWO - 1.72 * OENEG - 0.521 * CHIN$$

Credit: this variable is the firm credit index calculated by the firm's three-year sales standard deviation.

DEPENDTN: auditor dependence on the employer, which is measured through abnormal audit fees.

The abnormal audit fee is calculated from the residual of the following regression model. To calculate the residual of the audit fees, following Zigia and Zi (2017), the presented regression model of Francis and Wang (2005) is used as follows:

Model (2)

$$LAF = \beta_0 + \beta_1 LTA + \beta_2 CATA + \beta_3 QUICK + \beta_4 LEV + \beta_5 ROA + \beta_6 LAGOP + \beta_7 LOSS + \beta_8 SPECIALIST + \beta_9 BIG + \beta_{10} SWITCH + \varepsilon$$

Ln SIZE: natural logarithm of total firm assets in the year understudy

INVREC: total inventory and accounts receivable to total assets

ROA: net profit to total assets

LOSS: if the firm is losing 1, otherwise, 0

LEV: total liabilities to total assets

QUICK: current assets expect inventory to current debts

SGROWTH: percentage of changes in sales of the current year to that of the previous year

BIG: if the audit organization is the auditor of the firm 1 and if audit firms are the auditor 0

ATENURE: firm auditor tenure

AOPINION: if auditor opinion is not acceptable 1, otherwise, 0

INSTO: percentage of share held by institutional owners

SIZE: logarithm of total assets

TLTA: logarithm of total debts to total assets

WCTA: working capital divided by total assets

CLCA: current debts divided by current assets

NITA: net profit divided by total assets

FUTL: operational cash divided by total assets

INTWO: if the firm is losing in two consecutive years 1, otherwise, 0

OENEG: 1 if the total debts of the firm are more than total assets; otherwise, 0

CHIN: the difference between the net profit of the current year and that of the previous year divided by the absolute value of this difference

LTA: natural logarithm of total assets in the year understudy

CATA: current assets to total assets ratio

LEV: total debts to total assets

ROA: net profit to total assets ratio

LAGOP: if the firm has received conditional opinion in the previous year 1 and the case received acceptable report 0. Other types of audit reports are eliminated from the sample

SPECIALIST: 1 if the firm auditor in the year under study is among rank A firms; otherwise, 0

SWITCH: if the firm has changed the auditor in the year under study 1, otherwise, 0.