Relationships between Effective Tax Rate and Audit Fees: Evidence from Tehran Stock Exchange

Hamid Saremi, Shaban Mohammadi, Behrad Moein Nezhad

Abstract*: *In present study, we examine the relationships between effective tax rate and audit fees of the listed companies on the Tehran Stock Exchange (TSE). Data were gathered from the audited financial statements of the firms provided by TSE's website from 2010 to 2015. The results of multiple linear regression analysis show that effective tax rate have negative significant effects on audit fees. Firm size is significantly related to audit fees. Financial leverage and audit opinion were negative significantly related to audit fees. There is a significant relationship between loss report and audit fees. Also, there is a no significant relationship between accruals and audit fees. However, the results of fuzzy regression analysis indicate significant relationships between the independent variable except audit fees.

Keywords: effective tax rate, audit fees, audit opinion, loss report.JEL classification: G31, G34

I. INTRODUCTION

Hanlon, Slemrod, (2009) survey the stock price reaction to news about corporate tax aggressiveness. They understood that, on average, a company's stock price declines when there is news about its involvement in tax shelters. Also, they found some limited evidence for cross-sectional variation in the reaction. Krishnan, Visvanathan, (2008) did not find a significant relation between audit fees and accounting financial expertise for observations with weak governance structure. Bell et al, (2001) found that high business risk increases the number of audit hours, but not the fee per hour. Gul, et al, (2003)showed that there is a positive association between discretionary accruals and audit fees. Ayers et al, (2010) found that the association between changes in book–tax differences and rating changes is attenuated for high–tax-planning firms (e.g., where book–tax differences more likely reflect tax planning than decreased earnings quality). Lennox et al, (2013) found that tax aggressive U.S. public firms are less likely to commit accounting fraud. In this study, we examine the relationship between effective tax rate and audit fees. Our paper delivers new evidence on the link between effective tax rate and audit fees. Section 2 motivates the study and lists the hypotheses to be tested. Section 3 describes our research design, including measurement of primary variables and empirical specification. Section 4 describes sample selection and descriptive statistics, the results from our regression analyses. And Section 5 concludes.

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II. LITERATURE REVIEW AND HYPOTHESES

Al-Harshani, (2008) showed that the amount of external audit fees is significantly influenced by the audit client size, liquidity ratio, and profitability ratio. They found did not provide evidence of a significant relation between audit fees and the number of audit locations, or the size of the audit firm. Donohoe, Knechel (2014) found that tax aggressive firms pay higher fees for external audit services after controlling for factors related to earnings management. Dyreng,et al., (2008) found there is considerable cross-sectional variation in tax avoidance. For example, approximately one-fourth of our sample firms are able to maintain long-run cash effective tax rates below 20 percent, compared to a sample mean tax rate of approximately 30 percent. They also understood that annual cash effective tax rates are not very good predictors of long-run cash effective tax rates and thus, are not accurate proxies for long-run tax avoidance. Hanlon, et al., (2012) found that audit fees are higher as book-tax differences are large and negative, but not as much as when book-tax differences are large and positive. Phillips et al. (2003) document that firms that report small positive earnings have a larger deferred tax expense consistent with these firms managing financial reporting income upward to meet the target but not reporting the additional income for tax purposes. Mills and Newberry (2001) indicate evidence consistent with the magnitude of book-tax differences being positively associated with financial reporting incentives such as prior earnings patterns, financial distress, and bonus thresholds. Most research on audit fees follows from the model developed by Simunic (1980), who argues that audit fees are composed of a production (effort) component and an expected loss component. Production costs are related to the level of staff and amount of time (effort) needed to complete the engagement. Expected future losses include costs arising from litigation, reputation losses, and regulatory penalties that the auditor could incur after completing the engagement (Seetharman, et al., 2002). We extend this work by investigating the following question: What is the relationship between effective tax rate and audit fees? This question leads to the three following hypotheses in this paper:

H_1**:** There is a significant relationship between effective tax rate and audit fees.

H_2: There is a significant relationship between loss report and audit fees.

H_3**:** There is a significant relationship between financial leverage and audit fees.

H_4**:** There is a significant relationship between firm size and audit fees.

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H_5: There is a significant relationship between audit opinion and audit fees.

H_6: There is a significant relationship between accruals and audit fees.

III. DATA, VARIABLES AND MODEL

3.1. Data

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. 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.

3.2. Research model

The present research uses the model proposed for the hypotheses:

$$LN\ FEE_{i,t} = \beta_0 + \beta_1 \mathrm{ERT}_{i,t} + \beta_2 \mathrm{LNSIZE}_{i,t} + \beta_3 \mathrm{LEV}_{i,t} + \beta_4 \mathrm{LOSS}_{i,t} + \beta_5 \mathrm{OPIN}_{i,t} + \beta_6 \mathrm{LNACC}_{i,t} + \varepsilon_{i,t}$$

Table 1. Model variable definitions

$LN\ FEE_{i,t}$: for firm i in year t.
$\mathrm{ERT}_{i,t}$: For firm i in year t.
$\mathrm{LNSIZE}_{i,t}$: It is the natural logarithm of total sales for firm i in year t.
$\mathrm{LEV}_{i,t}$: Financial leverage for firm i in year t.
$\mathrm{LOSS}_{i,t}$: Loss report firm i in year t.
$\mathrm{OPIN}_{i,t}$:Auditor opinion for firm i in year t
$\mathrm{LNACC}_{i,t}$: It is the natural logarithm of accruals for firm i in year t

3.3. Research variable

3.3.1. Dependent variable

In this study, the dependent variable is audit fees. The present research uses the model proposed by (Simunic, 1980) for measuring audit fees:

$AUDFEE = P \times Q + E(L)$

P: Audit fees per hour of audit work.

Q: Total hours of audit work.

E (L): Risk premium due to the expected loss.

3.3.2. Independent variable

In this study, the independent variable is effective tax rate. The present research uses the model proposed by (Dyreng et al., 2008) for measuring effective tax rate:

$$long-run\ effective\ tax\ rate = \frac{\sum_{t=1}^{6} tax\ paid_t}{\sum_{t=1}^{6} pre{-}tax\ incom_t}$$

3.3.3. Control variable

In this study, the control variables are firm size, financial leverage, accruals, loss report and audit opinion.

$$financial\ leverage = \frac{total\ debt}{shareholders\ equity}$$

Firm size: It is the natural logarithm of total sales for firm.

Accruals: Accrual is the difference between the operating profit and operating cash flow.

Loss report: Equal to one if the Losses reported, zero otherwise

Audit opinion: Equal to zero if the auditor's opinion is unacceptable, one otherwise.

IV. SAMPLE SELECTION AND DESCRIPTIVE STATISTICS

Multivariate regression analysis and fuzzy regression analysis were applied at the 5% significance level for testing the hypotheses. Descriptive and inferential (multivariate and fuzzy regression analyses) analyses are used for testing the hypotheses of the research.

4.1. Descriptive analysis

Table 2. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
LNFEE	470	3.02	9.25	7.01	0.801
ETR	470	-%9	%120	%16	%31
LNSIZE	470	10.1	18.02	14.02	2.3
LEV	470	%5	%179	%59	%39
OPIN	470	8.2	15.3	11.25	9.25
LOSS	470	%8	%98	%58	%34
LNACC	470	-17.02	15.32	0.91	11.30

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In the regression model, the effect of the independent variable (ETR) on the audit fees 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 variable 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.

4.2. Regression analysis

Table 3. The results of estimating the regression model

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	CONSTANT	1.240	0.358	1.301	3.251	0.02
	ETR	-0.741	0.214	-0.665	-5.214	0.000
	LNSIZE	0.454	0.037	0.524	16.801	0.000
	LEV	-0.302	0.120	-0.235	-3.211	0.045
	OPIN	-0.235	0.102	-0.312	-3.011	0.045
	LOSS	0.201	0. 204	0.310	1.989	0.047
	LNACC	-0.002	0.008	-0.004	-0.952	0.400

Table 4. Model Summary

Model	Adjusted R Square	F	Durbin-Watson	Sig
	0.451	47.211	1.992	0.000

Fuzzy regression

Simple Linear Regression defined based on probability distribution, is always confronted with some limitations due to the hypotheses inflexibility. Also, the statistical regression models are used only when the observations' distribution is done based on a statistical model. But, the fuzzy regression models, in addition to their flexibility in adaptation to natural conditions, are an efficient instrument for demonstrating the effects of those variables with the same features. Time fuzzy regression is used when the variables or the observations are imprecise and vague, and when the relationship between variables is imprecise, as well as when the hypotheses' accuracy is uncertain (in small samples).However, in many cases, one or more hypotheses may be rejected or due to the sample size the hypothesis cannot be supported. In such cases, the common models do not have the required reliability and performance. The next alternative method is fuzzy regression. This kind of regression can be used when the variables or the relevant observations are imprecise and vague; also when the relationship between the variables is imprecise; or when the hypotheses are not certainly true (particularly, when the sample is small). The current study employs the fuzzy regression with fuzzy coefficients to examine the model. the regression model:

$$LN\ FEE = \alpha_0 + \alpha_1 \text{ERT} + \alpha_2 \text{LNSIZE} + \alpha_3 \text{LEV} + \alpha_4 \text{LOSS} + \alpha_5 \text{OPIN} + \alpha_6 \text{LNACC} + \theta_i$$

Assuming that:

$$y = LN\ FEE, x_1 = \text{ERT}, x_2 = \text{LNSIZE}, x_3 = \text{LEV}, x_4 = \text{LOSS}, x_5 = \text{OPIN}$$

$$, x_6 = \text{LNACC} \text{ And } \alpha_1 = (a_i, s_i) \text{ , i=0,1,…,6}$$

The objective function is expressed as follows:

$$z = 2 * 80s_0 + 2s_1 \sum_{j=1}^{80} |x_{1j}| + 2s_2 \sum_{j=1}^{80} |x_{2j}| +$$

$$2s_3 \sum_{j=1}^{80} |x_{3j}| + 2s_4 \sum_{j=1}^{80} |x_{4j}| + 2s_5 \sum_{j=1}^{80} |x_{5j}| +$$

$$2s_6 \sum_{j=1}^{80} |x_{6j}|$$

Two constraints are defined for each observation with a total of 416 constraints. For instance, the first two constraints are as follows:

$$(1-h)s_0 + (1-h)s_1|0.3| + (1-h)s_2|89| +$$

$$(1-h)s_3|88| + (1-h)s_4|0.5| + (1-h)s_5|87| +$$

$$(1-h)s_6|0.8| - a_0 + a_1|0.3| + a_2|89| + a_3|88| +$$

$$a_4|0.5| + a_5|0.87| + a_6|0.8| \geq -0.09$$

Minimizing the objective function (z) with respect to the 416 constraints as well as $s_0 \geq 0$ for i= 0,1,…,6 and $a_i = 0,1, \dots ,6$ is a problem in linear programming that is solved by Lingo software. Solving the problem for $h\epsilon(0,1)$ leads to the data provided in Table5.

Table 5. Estimating the objective function based on different membership degrees

h	s_0	z
0.1	0.39	79
0.2	0.43	89
0.3	0.49	103
0.4	0.57	119
0.5	0.24	142
0.6	0.86	179
0.7	1.14	232
0.8	1.8	355
0.9	3.5	710

Considering the above Table, we will have the following calculations for all the h values:

$$s_0 = s_1 = s_2 = s_3 = s_4 = s_5 = s_6 = 0$$

$$a_0 = 0.17, a_1 = 0.21, a_2 = 0.008, a_3 = 0.11, a_4 = 0.10, a_5 = 0.12, a_6 = 0$$

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By replacing the coefficients obtained in the regression model, for certain values of independent variables the output is fuzzy and in the form of symmetric triangular fuzzy numbers. Therefore, we defuzzify the output using Center of Area (COA) in MATLAB. Finally, the MSE of the model can be obtained by comparing the estimated model with real values. In this case, the final regression model is the one with the lowest MSE. The output of MATLAB is provided in Table 6.

Table 6. Estimating the objective function based on real value

h	α_0	MSE
0.1	0.171	0.0320
0.2	0.182	0.0313
0.3	0.172	0.0318
0.4	0.173	0.0320
0.5	0.180	0.0318
0.6	0.172	0.0317
0.7	0.164	0.0315
0.8	0.162	0.0316
0.9	0.08	0.0318

Considering the Table above, the lowest MSE occurs when h=0.09.

Therefore, the fuzzy regression model is:

$$\tilde{y} = 0.17 + 0.21x_1 + 0.008x_2 + 0.11x_3 + 0.10x_4 + (-0.12)x_5 + 0x_6$$

Defuzzification gives the following model

$$y = 0.008 + 0.21x_1 + 0.008x_2 + 0.11x_3 + 0.10x_4 + (-0.12)x_5 + 0x_6$$

Hypothesis 1

According to the first hypothesis effective tax rate (ETR) is significantly associated with audit fees. Based on the results of multivariate regression model (Table 3), ETR has a beta coefficient of -0.741and p-value of 0.002 Therefore; there is a negative significant relationship between ETR and audit fees at 5% significance level.

Hypothesis 2

According to the second hypothesis loss report (LOSS) is significantly associated with audit fees. Based on the results of multivariate regression model (Table 3), LOSS has a beta coefficient of 0.201and p-value of 0.047 Therefore; there is a significant relationship between LOSS and audit fees at 5% significance level.

Hypothesis 3

According to the third hypothesis financial leverage (LEV) is significantly associated with audit fees. Based on the results of multivariate regression model (Table 3), LEV has a beta coefficient of -0.302 and p-value of 0.045 Therefore, there is a negative significant relationship between LEV and audit fees at 5% significance level.

Hypothesis 4

According to the third hypothesis firm size (LNSIZE) is significantly associated with audit fees. Based on the results of multivariate regression model (Table 3), LNSIZE has a beta coefficient of 0.4545and p-value of 0.000 Therefore; there is a significant relationship between LNSIZE and audit fees at 5% significance level.

Hypothesis 5

According to the third hypothesis audit opinion (OPIN) is significantly associated with audit fees. Based on the results of multivariate regression model (Table 3), OPIN has a beta coefficient of -0.235 and p-value of 0.045 Therefore, there is a negative significant relationship between OPIN and audit fees at 5% significance level.

Hypothesis 6

According to the third hypothesis accruals (LNACC) is significantly associated with audit fees. Based on the results of multivariate regression model (Table 3), LNACC has a beta coefficient of -0.002and p-value of 0.400 Therefore; there is a no significant relationship between LNACC and audit fees at 5% significance level.

Table5. Results of testing the hypothesis with multivariate regression analysis

Variable	Beta	Sig	Result
ETR	-0.741	0.000	accepted
LOSS	0.201	0.047	accepted
LEV	-0.302	0.045	accepted
LNSIZE	0.454	0.000	accepted
OPIN	-0.235	0.045	accepted
LNACC	-0.002	0.400	rejected

V. CONCLUSION

The present research examined the relationship between seven variables (effective tax rate, Firm size, financial leverage, audit opinion, loss report, and accruals.) and audit fee of the 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 negative significant relationship between financial leverage and audit opinion with audit fee. There is a positive significant relationship effective tax rate firm size with audit fee. According to findings, that there is no a significant relationship between accruals with audit fee. This finding is consistent with results (Donohoe and Knechel, 2014) and (Hanlon, et al., 2013). The limitation is related to

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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.

REFERENCES

1. Al-Harshani, M. O. (2008). The pricing of audit services: evidence from Kuwait. Managerial Auditing Journal, 23(7): 685-696
2. Ayers, B., Laplante, S. & Mcguire, S. (2010). Credit Ratings and Taxes: The Effect of Book–Tax Differences on Ratings Changes. Contemporary Accounting Research, 27 (2): 359-402.
3. Bell, T., Landsman, W. & Shackelford, D. (2001). Auditors' Perceived Business Risk and Audit Fees: Analysis and Evidence. Journal of Accounting Research, 39 (1): 35-43.
4. Donohoe, M. & Knechel, R. (2014). Does corporate tax aggressiveness influence audit pricing? Contemporary Accounting Research, 31 (1): 284-308.
5. Dyreng, S., Hanlon, M. & Maydew, E. (2008). Long-run corporate tax avoidance. The Accounting Review, 83 (1): 61-82.
6. Graham, J., Raedy, J. & Shackelford, D. (2012). Research in accounting for income taxes. Journal of Accounting and Economics, 53(1-2): 412-434.
7. Gul, F. A., Chen, C.J.P. & Tsui, J.S.L. (2003). Discretionary Accounting Accruals, Managers' Incentives, and Audit Fees. Contemporary Accounting Research, 20 (3): 441-464.
8. Hanlon, M. & Heitzman, S. (2010). A review of tax research. Journal of Accounting and Economics, 50(2-3): 127-178.
9. Hanlon, M. & Slemrod, J. (2009). What Does Tax Aggressiveness Signal? Evidence from Stock Price Reactions to News about Tax Shelter Involvement. Journal of Public Economics, 93(1-2):126-141.
10. Hanlon, M., Krishnan, G. & Mills, L. (2012). Audit fees and book-tax differences. Journal of the American Taxation Association, 34 (1): 55-86.
11. Krishnan, G. & Visvanathan, G. (2008). Do auditors price audit committee's expertise? The case of accounting vs. non-accounting financial experts. Journal of Accounting, Auditing & Finance, 24(1): 115-144.
12. Lennox, C., Lisowsky, P., Pitman, J., (2013). Journal of Accounting Research,Volume 51, Issue 4, pages 739–778,
13. Mills, L., and K. Newberry. (2001). The Influence of Tax and Non-Tax Costs on Book-Tax Reporting Differences: Public and Private Firms. Journal of American Taxation Association 23 : 1-19.
14. Phillips, J., M. Pincus, and S. Rego. 2003. Earnings Management: New Evidence Based on the Deferred Tax Expense. The Accounting Review 178 (April): 491-522.
15. Seetharaman, A., F. Gul, and S. Lynn. (2002). Litigation risk and audit fees: Evidence from UK firms cross-listed on US markets. Journal of Accounting & Economics (33): 91-115.
16. Simunic, D. (1980). The pricing of audit services: Theory and evidence. Journal of Accounting Research, 18 (1): 161-190.

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