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Audit fees and discretionary accruals: compensation structure effect

Fatima Alali
Department of Accounting, College of Business and Economics, California State University, Fullerton, California, USA

Abstract

Purpose – The purpose of this paper is to examine the relationship between discretionary accruals (DAs) and audit fees and whether this relationship is affected by the chief financial officer's (CFO) compensation structure.

Design/methodology/approach – Using a large sample of cross-sectional firms over the period 2000-2006, multiple ordinary least square regression models are estimated.

Findings – The paper finds that there is a positive and significant association between DAs and audit fees. Evidence shows that this relationship is significantly higher as CFO's bonuses increase and that this relationship is moderated as CFO's salaries increase. It is also found that income-increasing DAs are positively and significantly related with audit fees and that increase in CFO's bonuses signifies this positive relationship.

Research limitations/implications – Results may change during the current financial crisis (i.e. 2007-present) due to the increased regulatory scrutiny of executive compensation.

Practical implications – The study has regulatory implications because of the recent calls to require a mandate regulating executive compensation practices. The results support these calls as data show that increased bonuses are associated with higher discretionary accruals and thus higher audit fees. There is also a call to limit executive compensation to fixed amounts and data support that increase in salaries moderates the positive association between discretionary accruals and audit fees. These results can also be used by independent auditors when assessing risks and thus the results have practical audit implications.

Originality/value – The paper uses a large sample of public firms in years leading to the current financial crisis and contributes to the literature in executive compensation and audit practice.

Keywords Auditor's fees, Remuneration, Bonuses, Chief executives, United States of America

Paper type Research paper

1. Introduction

The study examines the relationship between audit fees and discretionary accruals (DAs) and whether this relationship is affected by the chief financial officer's (CFO) compensation structure. The study uses the arguments and methods of Gul *et al.* (2003) with recent data from the USA. A positive relationship between DAs and audit fees is expected, Gul *et al.* (2003). DAs are related to accounting items that require judgment. As such, as DAs increases, inherent risk assessment increases that would lead to require more audit work, extensive reviews and close supervision of staff to achieve a desired level of audit assurance, (Arens *et al.*, 2008). Therefore, an increase in audit work is associated with increase in audit fees. Moreover, the study examines the differences of the effect of the CFO's compensation structure on the relationship between DAs and audit fees (Gul *et al.*, 2003). Prior studies provide some evidence on the differential

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incentives provided to CFOs by different compensation components such that CFOs with higher accounting-based compensation are more likely to be involved in opportunistic behavior to maximize the value of their accounting-based compensation (Jiang *et al.*, 2009). As such, a positive relationship is expected between DAs and audit fees and that this relationship becomes stronger at higher levels of CFOs' accounting-based compensation components (Gul *et al.*, 2003). However, Sarbanes-Oxley (SOX, 2002) subjects CFOs to increased scrutiny and expensive penalties for misreporting. As a result, CFOs have incentives to prepare higher quality financial reports and/or to hire higher quality audit to detect potentially material misstatements in the financial statements (Hoitash *et al.*, 2009). Thus, it is an empirical question to simultaneously test for the effect of different compensation components on the relationship between DAs and audit fees.

Using a sample of 8,187 US observations over the period 2000-2006, evidence was documented that DAs in general and income-increasing DAs in particular, are positively and significantly related to audit fees. Increases in CFOs salaries are associated with a reduction in the positive relationship between DAs and audit fees. On the other hand, increases in CFOs bonuses (short-term accounting-based component of compensation) significantly strengthen the positive association between DAs and audit fees. Other components of CFOs compensation are statistically not significant. In the additional analysis, the results of the pooled sample are driven by the income-increasing accruals. In addition, the positive relationship between DAs and audit fees that is signified by increase in CFOs bonuses is more prevalent in the large firms subsample. The results using pre- and post-SOX subsamples are inconclusive, however.

The study contributes to the exiting literature in the following ways. First, using a large recent US sample, the study provides evidence on the effect of the CFO's compensation structure on DAs and audit fee relationship. This relationship is important empirical question because CFOs have the responsibility for accounting and financial reporting and SOX exposes CFOs to increased scrutiny and potential penalties if they falsely certify the periodical financial reports (Hoitash *et al.*, 2009). Therefore, the study has regulatory implications as executive compensation has come under scrutiny in years leading to the current financial crisis even though the study do not test the crisis period due to data availability. However, the results of the study support the recent calls for regulatory reforms on corporate executive compensation. The calls for reforms suggest more emphasis on fixed and long-term incentive plans as opposed to short-term incentive plans. This study's results support the emphasis on salary and bonus to alter incentives provided to the CFOs through the compensation structure. Second, the results have practical implications as auditors may consider the CFOs compensation structure when determining the audit fees because of the opportunistic incentives it provides to CFOs. As bonuses increase, inherent risk due to increase in DAs is associated with increase in audit effort and audit fees. As salaries increase, inherent risk due to increase in DAs is moderated and thus audit efforts and audit fees will go down. Third, the study adds to the literature that compares the CFO's opportunistic behavior compared to that of the chief executive officers (CEOs). The study also provides some evidence on the differential effect of the opportunistic use of income-increasing and income-decreasing accruals and whether size of client matters in mitigating or encouraging this discretionary behavior.

The remainder of the paper is organized as follows: Section 2 presents prior studies and develops the hypotheses. Section 3 discusses the sample selection and research design. Section 4 discusses the empirical results, and Section 5 concludes the study.

2. Literature review and hypothesis development

The study examines the relationship between DAs and audit fees and whether this relationship is affected by the compensation structure of the CFOs. Gul *et al.* (2003, p. 444) indicate that "accruals may be used opportunistically by managers to conceal pool performance and/or to postpone a portion of unusually high current earnings to future years" as studied by DeAngelo (1988), DeAngelo *et al.* (1994), Perry and Thomas (1994), Warfield *et al.* (1995), and Guay *et al.* (1996). Accounting estimates have high inherent risk and DAs are related to these accounting estimates, as such auditor is expected to collect more evidence, assign more experienced staff and closely reviews the work done when inherent risk is high[1] (Arens *et al.*, 2008, p. 265). As a result, the cost of doing the audit increases[2]. O'Keefe *et al.* (1994) in Gul *et al.* (2003) indicate that there is a positive relationship between inherent risk and audit work (both in terms of number of labor hours and mix of labor hours). Therefore, the first hypothesis is stated as follows:

H1. There is a positive relationship between DAs and audit fees.

Accounting and finance literature have extensively studied the relationship between executive compensation and earnings management. Balsam (1998) shows that as the level of DAs increases, the association between CEO's compensation and reported income generally increases. Lambert and Larcker (1987) in Gul *et al.* (2003) show that executive compensation level is associated with accounting earnings[3], [4]. Graham *et al.* (2005) report the CFOs use DAs to smooth earnings in order to meet or beat analysts' forecasts. Jiang *et al.* (2009) show that CFOs' equity incentives significantly dominate those of the CEOs' in explaining the probability of a firm meeting or beating analyst earnings forecasts. Bergstresser and Philippon (2006) find that CEOs' equity compensation is associated with accrual management. Cheng and Warfield (2005) and McAnally *et al.* (2008) in Jiang *et al.* (2009) find that CEOs' equity compensation is associated with increased likelihood of beating earnings benchmarks. Unlike Burns and Kedia (2006), Jiang *et al.* (2009) show that CFOs stock option sensitivity is more significantly related to restatements compared to the CEOs stock option sensitivity[5].

This study focuses on CFOs compensation structure because CFOs make decisions related to financial statements, accounting policies and preparation of financial statements (Hoitash *et al.*, 2009). Moreover, SOX requires that if an issuer restates previously reported financial statements due to material misstatements as a result of misconduct of the CEO and CFO, the CEO and CFO must forfeit all profits generated from the sale of securities during that period covered by the misstated financial statements and also reimburse bonuses and equity- and accounting-based compensation during the one-year period following the filing of the misstated financial statements (SOX, 2002 in Hoitash *et al.*, 2009). In addition, Hoitash *et al.* (2009) provide that the requirements of SOX under Section 906 increase the responsibilities the CEOs and CFOs of public companies face and thus providing incentives to the CEOs and CFOs to have more reliable financial statements. Other studies also show that CFO's compensation has increased at greater rate compared to other non-CEO officers (Wang, 2007) and that bonus components of the compensation is adjusted for the quality of the financial reporting CFOs (Collins *et al.*, 2009), in Hoitash *et al.* (2009).

The study focuses on accounting-based compensation (i.e. bonuses, stock options grants and long-term incentive plans) that provides incentives to use DAs to achieve targeted accounting numbers. Jiang *et al.* (2009) report several studies that examine

compensation structure. For example, Fuller and Jensen (2002) indicate that as the stock option component of compensation increases, the CEO and CFO tend to increase short-term stock prices as oppose to long-term stock prices. Katz (2006) provides that as managers become more concerned about their personal wealth, there is an increased likelihood of misreporting to increase stock prices. Jiang *et al.* (2009) show that the magnitude of DAs are more increasing in CFOs equity incentives than in CEO's equity incentives over a period 1993-2001 (i.e. pre-SOX period) but not in 2002-2006 (i.e. post-SOX period).

The study uses the argument that at a higher accounting-based CFO compensation, auditor would believe that CFOs will use DAs opportunistically. Therefore, inherent risk associated with DAs increases even more and higher audit fees are charged to warrant the increase in audit efforts due to this higher inherent risk. Moreover, it is arguable that regardless of the compensation structure, due to penalties that the CFOs are subject to under SOX and job-security issues, CFOs have incentives to have higher quality audit to detect potentially material misstatements in the financial statements (Hoitash *et al.*, 2009). As a result, a positive or insignificant effect of CFOs compensation structure on the relationship between audit fees and DAs may be observed. Therefore, the second hypothesis is exploratory and stated in the null form as follows:

H2. There is no differential effect of the CFO's compensation structure on the positive relationship between DAs and audit fees.

3. Sample selection and data collection

Data are obtained from Compustat Industrial and Audit Analytics including Compustat segments, and internal control subsets for variables of interest over the period 2000-2006[6]. These datasets are merged and data with missing audit fees, total assets and income from continuing operations and business and geographic segments are eliminated. This procedure resulted in 100,876 firm-year observations covering the period 2000-2006. ExecComp data are obtained for which firm-year observations covered in the database and with salary, bonus, Black-Scholes options value, long-term incentives-based compensation, restricted stocks and total annual compensation for executives are non-missing. This resulted in 45,279 firm-year observations. This dataset is then merged with the 100,876 firm-year observation from Compustat Industrial and Audit Analytics for which compensation and financial accounting data are available, resulting in 36,218 executive-year observations covering the period 2000-2006. This test sample includes 8,187 CEO- and CFO-firm-year observations (ExecComp data item: TITLEANN = CFO and ExecComp data item: CEOANN = CEO)[7], in addition to the other disclosed executive-year observations covered by the ExecComp database. The pooled sample of 36,218 observations is used to test *H1* and the subsample 8,187 of CEO/CFO – firm-year observations is used to retest *H1* and test *H2*.

4. Model development

The general audit fee model used in prior studies represents audit fees as a function of client size, client complexity, client risk and audit quality (Gul *et al.*, 2003; Simunic, 1980; Francis, 1984; Craswell *et al.*, 1995):

$$\begin{aligned}\text{Log(Fee)} = {} & \beta_0 + \beta_1\text{Log(Assets)} + \beta_2\text{Log(Busseg)} + \beta_3\text{Log(Geoseg)} \\ & + \beta_4\text{Inventory} + \beta_5\text{Receivables} + \beta_6\text{Debt} + \beta_7\text{Income} + \beta_8\text{Loss} \\ & + \beta_9\text{Opinion} + \beta_{10}\text{ICP} + \beta_{11}\text{Big4} + \beta_{12}\text{INCI} + \beta_{13}\text{DA} \\ & + \beta_{14-24}(\text{IndustryD}) + \beta_{25-30}(\text{YearD}) + \varepsilon\end{aligned} \quad (1)$$

where:

Log(Fee)	natural logarithm of audit fees paid to the auditor.
Log(Assets)	natural logarithm of total assets (Compustat data item 6).
Log(Busseg)	natural logarithm of the number of business segments reported on the Compustat Segment Data File.
Log(Geoseg)	natural logarithm of the number of geographic segments reported on the Compustat Segment Data File.
Inventory	ratio of the dollar value of inventory (item 3) to beginning balance total assets (item 6).
Receivables	ratio of the dollar value of accounts receivables (item 2) to beginning balance total assets (item 6).
Debt	sum of short-term debt (item 34) and long-term debt (item 9) to beginning balance total assets (item 6).
Income	ratio of operating income after depreciation (item 178) to average total assets (item 6).
Loss	indicator variable that is equal to 1 if the firm reports negative income in any of the previous three years, and 0 otherwise.
Opinion	indicator variable equal to 1 if the firm receives a going concern opinion, and 0 otherwise (going concern opinion is obtained from Audit Analytics).
ICP	indicator variable that is equal to 1 if a firm's internal control opinion is "ineffective" and 0 otherwise (this variable is obtain from Audit Analytics).
Big4	indicator variable equals to 1 if a firm's auditor is a Big4 and 0 otherwise.
INCI	indicator variable equal to 1 if DAs are income-increasing, and 0 otherwise.
DA	discretionary accruals as measured by cross-sectional modified Jones (1991) model estimated and is described below.
IndustryD	indicator variables for industry as defined in Frankel *et al.* (2002).
YearD	the indicator variables for years 2001-2006.

Audit fees are expected to be increasing in relation to firm size, complexity as measured by the log of segments, and risk (Inventory, Receivables, Debt, and Opinion).

Prior studies also show that fees are negatively related to profitability (Income). Firms in financial difficulty (Loss) are also expected to pay higher fees due to the increased risk associated with these firms. To control for the increase in audit fees for firms which reported material weaknesses in internal controls over financial reporting, an indicator variable that is equal to 1 if internal controls over financial reporting are not effective is included. To control for the differential effect of audit pricing (and audit quality) across Big4 and non-Big4, an indicator variable is included that equals to 1 if Big4 is the independent auditor and 0 otherwise.

The cross-sectional modified Jones (1991) is used to measure DAs. A dummy variable, INCI that is equal to 1 for income-increasing accruals and equals to 0 for income-decreasing accruals is also included. This is because income-increasing accruals may be perceived by auditors to be riskier than income-decreasing DAs (Gul *et al.*, 2003). In the model, industry and year indicator variables are included to control for industry- and year-specific effects on audit fees. High-litigation industries are expected to have higher audit fees (Frankel *et al.*, 2002) and post-SOX period has also seen higher audit fees.

To test *H2*, a subsample of CEO/CFO – firm-year data are used, a total of 8,187 observations. The effect of CFO's compensation structure on the relationship between DAs and audit fees is tested. The following model is estimated:

$$\begin{aligned}\text{Log(Fee)} = {} & \beta_0 + \beta_1\text{Log(Assets)} + \beta_2\text{Log(Busseg)} + \beta_3\text{Log(Geoseg)} \\ & + \beta_4\text{Inventory} + \beta_5\text{Receivables} + \beta_6\text{Debt} + \beta_7\text{Income} + \beta_8\text{Loss} \\ & + \beta_9\text{Opinion} + \beta_{10}\text{ICP} + \beta_{11}\text{Big4} + \beta_{12}\text{INCI} + \beta_{13}\text{DA} + \beta_{14}\text{CFOD} \\ & + \beta_{15}\text{Salary} + \beta_{16}\text{Bonus} + \beta_{17}\text{Options} + \beta_{18}\text{Restrict} + \beta_{19}\text{Ltips} \\ & + \beta_{20}(\text{Salary}^{*}\text{DA}) + \beta_{21}(\text{Bonus}^{*}\text{DA}) + \beta_{22}(\text{Options}^{*}\text{DA}) \\ & + \beta_{23}(\text{Restrict}^{*}\text{DA}) + \beta_{24}(\text{Ltips}^{*}\text{DA}) + \beta_{25}(\text{CFOD}^{*}\text{DA}) \\ & + \beta_{26}(\text{CFOD}^{*}\text{Salary}) + \beta_{27}(\text{CFOD}^{*}\text{Bonus}) + \beta_{28}(\text{CFOD}^{*}\text{Options}) \\ & + \beta_{29}(\text{CFOD}^{*}\text{Restrict}) + \beta_{30}(\text{CFOD}^{*}\text{Ltips}) + \beta_{31}(\text{CFOD}^{*}\text{Salary}^{*}\text{DA}) \\ & + \beta_{32}(\text{CFOD}^{*}\text{Bonus}^{*}\text{DA}) + \beta_{33}(\text{CFOD}^{*}\text{Options}^{*}\text{DA}) \\ & + \beta_{34}(\text{CFOD}^{*}\text{Restrict}^{*}\text{DA}) + \beta_{35}(\text{CFOD}^{*}\text{Ltips}^{*}\text{DA}) \\ & + \beta_{36-47}(\text{IndustryD}) + \beta_{48-53}(\text{YearD}) + \varepsilon \end{aligned} \tag{2}$$

where control variables are as described above and:

Salary	salary to annual total assets.
Bonus	bonus to annual total assets.
Options	Black-Scholes options value granted to CFO to annual total assets.
Restrict	restricted stock compensation to annual total assets.
Ltips	long-term incentive plans to annual total assets.
CFOD	indicator variable equals 1 if executive is a CFO, and 0 otherwise.
CFOD*Salary*DA	interaction variable of CFOD*Salary and DA.

CFOD*Bonus*DA	interaction variable of CFOD*Bonus and DA.
CFOD*Options*DA	interaction variable of CFOD*Options and DA.
CFOD*Restrict*DA	interaction variable of CFOD*Restrict and DA.
CFOD*Ltips*DA	interaction variable of CFOD*Ltips and DA.

In addition, to best specify the model, all two-variable interaction terms are included in the model (Aiken and West, 1991). Following Gul *et al.* (2003), CFO's compensation components are scaled by total assets. This assumes that executive compensation is largely explained by the firm's size (total assets) and that executive compensation is likely to be performance-based if this ratio is very high (Gul *et al.*, 2003). The interaction variables (CFOD*Salary*DA), (CFOD*Bonus*DA), (CFOD*Options*DA), (CFOD*Restrict*DA) and (CFOD*Ltips*DA) examine the effect of CFO's compensation structure on the relationship between DAs and audit fees. These interactions terms are used to test *H2*.

5. Results

Descriptive statistics

Table I provides the descriptive statistics of the pooled sample ($n = 36{,}218$ firm-year observations). Panel A shows that on average, log of total assets of the firms in the sample is 7.2 and log of audit fees is 13.74. Log of number of business segments and geographic segments are 1.8 and 1.9, respectively. Average inventory to total assets is 10.68 per cent and average accounts receivable to total assets is 13.93 per cent. On average, leverage is 18.94 per cent and average net income before extraordinary items scaled by total assets is 7.32 per cent. About 14 per cent of the sample incurred losses on average 1.57 per cent of the sample have going concern opinion and 3.5 per cent of the sample have ineffective internal controls over financial reporting opinion, over the 2000-2006. On average, about 91 per cent of the sample is audited by Big4. DAs are averaged 9.46 per cent with income-increasing accruals representing 71 per cent of the sample. On average, salaries, bonuses, options and restricted stock plans are 0.86, 0.03, 0.11 and 0.01 per cent of total assets, respectively.

Panel B provides the descriptive statistics of the 8,187 CEO/CFO firm-year observations. Average log of total assets in this subsample is 7.17 and average log of audit fees is 13.76. About 12 per cent of this subsample incurred losses, 1.4 per cent has going concern opinion, 91 per cent are audited by Big4, and 3.7 per cent have ineffective internal controls over financial reporting. Average DAs is 0.086 with 70 per cent of the sample have income-increasing DAs. Average compensation components are significantly higher than the pooled sample, which is expected. Average salary to total assets is 0.86 per cent, average bonuses to total assets is 0.05 per cent, average Black-Scholes option value to total assets is 0.18 per cent, average long-term incentives-based compensation to total assets is 0.00 per cent[8] and average restricted stock option to total assets is 0.03 per cent. By construction, the average of client risk, complexity and other control variables are comparable to those reported in Table I Panel A.

Panel C provides the pooled sample distribution by industry and year. Industry indicators are composed using four-digit SIC codes based on Frankel *et al.* (2002). About 27 per cent of the sample comes from durable manufacturing, about 18 per cent from computers, and about 12 per cent from services. Other industries are represented

Panel A. Pooled sample (n = *36,218)*

Variable	*Mean*	*SD*	*25th Percentile*	*Median*	*75th Percentile*
Log(Fee)	13.7403	1.181	12.8816	13.6755	14.5541
Log(Assets)	7.2018	1.515	6.1177	7.045	8.1586
Log(Busseg)	1.8083	0.7429	1.0986	1.9459	2.4849
Log(Geoseg)	1.9043	0.7175	1.0986	1.7918	2.4849
Inventory	0.106	0.1118	0.0138	0.0789	0.1566
Receivables	0.1385	0.0932	0.0688	0.1233	0.1882
Debt	0.1856	0.1734	0.0099	0.1658	0.2934
Income	0.0766	0.1086	0.0389	0.0812	0.1311
Loss	0.1396	0.3466	0	0	0
Opinion	0.0157	0.1245	0	0	0
Big4	0.9074	0.2899	1	1	1
ICP	0.0352	0.1842	0	0	0
DA	0.0896	0.1814	0	0.0388	0.1274
INCI	0.7147	0.4516	0	1	1
Salary	0.0086	0.0007	0.0086	0.0086	0.0086
Bonus	0.0003	0.0012	0	0.0001	0.0003
Options	0.0011	0.0059	0	0.0002	0.0007
Ltips	0.0000	0.0002	0	0	0
Restrict	0.0001	0.0023	0	0	0
Panel B. CEO/CFO subsample (n = *8,187)*					
Log(Fee)	13.7656	1.1727	12.9157	13.7112	14.5638
Log(Assets)	7.1686	1.4782	6.1318	7.0102	8.1083
Log(Busseg)	1.8223	0.7352	1.0986	2.0794	2.4849
Log(Geoseg)	1.9017	0.7155	1.0986	1.7918	2.4849
Inventory	0.1089	0.1126	0.0165	0.0817	0.1599
Receivables	0.1398	0.0935	0.0697	0.1244	0.1893
Debt	0.183	0.1722	0.0094	0.1628	0.2914
Income	0.0846	0.1009	0.0461	0.0848	0.1352
Loss	0.1173	0.3217	0	0	0
Opinion	0.014	0.1177	0	0	0
Big4	0.9146	0.2795	1	1	1
ICP	0.0375	0.19	0	0	0
DA	0.0814	0.171	0	0.0346	0.1162
INCI	0.7033	0.4568	0	1	1
Salary	0.0086	0.0009	0.0086	0.0086	0.0086
Bonus	0.0005	0.0021	0.0000	0.0002	0.0005
Options	0.0018	0.0078	0	0.0003	0.0013
Ltips	0.0000	0.0003	0	0	0
Restrict	0.0003	0.0047	0	0	0.0001

Panel C. Pooled sample distribution by year and industry

	Sample (%)		*Sample (%)*
Mining/construction	1.56	2000	10.77
Agriculture	0.31	2001	16.72
Food	2.26	2002	17.36
Computers	18.46	2003	18.04
Chemicals	3.82	2004	17.52
Pharmaceuticals	3.55	2005	16.59
Extractive	3.41	2006	3.00
Durable manufacturing	26.53		
Transportation	4.74		

(*continued*)

Table I.
Descriptive statistics

Utilities	6.09
Retail	12.26
Services	8.53
Financial	1.95
Textile/printing/publishing	6.53

Notes: Log(Fee), natural logarithm of audit fees paid to the auditor; Log(Assets), natural logarithm of total assets (item 6); Log(Busseg), natural logarithm of the number of business segments reported on the Compustat Segment Data File; Log(Geoseg), natural logarithm of the number of geographic segments reported on the Compustat Segment Data File; Inventory, ratio of the dollar value of inventory (item 3) to beginning balance total assets (item 6); Receivables, ratio of the dollar value of accounts receivables (item 2) to beginning balance total assets (item 6); Debt, sum of short-term debt (item 34) and long-term debt (item 9) to beginning balance total assets (item 6); Income, ratio of operating income after depreciation (item 178) to average total assets (item 6); Loss, indicator variable that is equal to 1 if the firm reports negative income in any of the previous three years, and 0 otherwise; Opinion, indicator variable equal to 1 if the firm receives a going concern opinion, and 0 otherwise; ICP, indicator variable that is equal to 1 if a firm's internal control opinion is "ineffective" and 0 otherwise; Big4, indicator variable equals to 1 if a firm's auditor is a Big4 and 0, otherwise; INCI, indicator variable equal to 1 if DAs are income-increasing, and 0 otherwise; DA, discretionary accruals measured by cross-sectional modified Jones (1991) model

Table I.

by 3-8 per cent of the sample. The pooled sample includes data from 2000-2006. About 11 per cent of the sample is from 2000, and between 16 and 18 per cent of the sample is presented by years 2001-2005. Year 2006 data represents 3 per cent of the pooled sample. Sample distribution for CEO/CFO subsample is comparable to the pooled sample's reported distribution.

Multiple regression results

Relationship between DAs and audit fees. Table II model 1 provides the test results of *H1* that there is a positive association between audit fees and DAs using the pooled sample. The coefficient of DA is positive and significant at 0.01 indicating that an increase in DAs by $1 results in increase in log audit fees by $0.2465. Moreover, model 1 shows that the coefficient of INCI is positive but not significant indicating that income-increasing accruals are associated with higher audit fees, and vice versa. The coefficient of DA therefore support *H1*. In addition, the coefficients on Log(Assets), Log(Busseg), Log(Geoseg), Receivable, Debt, Income, Loss, Opinion, Big4, and ICP are all in the expected direction and significant at 0.01 or better. Model 2 in Table II provides the test results of *H1* using the CEO/CFO subsample. The coefficient of DA is positive and significant at 0.01 level and coefficient of INCI is positive and significant at 0.10 level. These results provide additional support to *H1* that there is a positive association between DAs and audit fees. The adjusted R^2 for models reported in Table II are about 76 per cent and the *F*-value is significant at 0.01 suggesting that the overall model is significant in explaining variation in the dependent variable.

The effect of CEOs and CFOs compensation structure on the relationship between DAs and audit fees. Table III provides the ordinary least square (OLS) regression results testing *H2* that there is an effect of the CFO's compensation structure on the positive relationship between DAs and audit fees. The variables of interest are: CFOD*Salary*DA, CFOD*Bonus*DA, CFOD*Options*DA, CFOD*Restrict*DA, CFOD*Ltip*DA. Using CEO/CFO subsample, the only coefficients that are statistically significant at 0.01 are:

	Model 1		Model 2	
	Coefficient	$Pr > \|t\|$	Coefficient	$Pr > \|t\|$
Dependant variable: Log(Fee)				
Intercept	8.2445	<0.0001	8.2159	<0.0001
Log(Assets)	0.5491	<0.0001	0.5401	<0.0001
LOG(Busseg)	0.1016	<0.0001	0.1049	<0.0001
Log(Geoseg)	0.2369	<0.0001	0.2398	<0.0001
Inventory	−0.1212	<0.0001	−0.0889	0.1175
Receivables	2.0773	<0.0001	1.9847	<0.0001
Debt	0.1170	<0.0001	0.1722	<0.0001
Income	−0.7421	<0.0001	−0.8088	<0.0001
Loss	0.0270	0.0332	−0.0048	0.8611
Opinion	0.2549	<0.0001	0.2286	<0.0001
Big4	0.1220	<0.0001	0.1549	<0.0001
ICP	0.5453	<0.0001	0.5247	<0.0001
DA	0.2465	<0.0001	0.2061	<0.0001
INCI	0.0055	0.4718	0.0273	0.0829
CFOD			−0.0370	0.0065
YearD	Included		Included	
IndustryD	Included		Included	
n	36,218		8,187	
Adjusted R^2	0.7613		0.7672	
F-value ($Pr > F$)	5,777.11 (<0.0001)		12,85.83 (<0.0001)	

Notes: Test of *H1* $\text{Log(Fee)} = \beta_0 + \beta_1\text{Log(Assets)} + \beta_2\text{Log(Busseg)} + \beta_3\text{Log(Geoseg)} + \beta_4\text{Inventory} + \beta_5\text{Receivables} + \beta_6\text{Debt} + \beta_7\text{Income} + \beta_8\text{Loss} + \beta_9\text{Opinion} + \beta_{10}\text{ICP} + \beta_{11}\text{Big4} + \beta_{12}\text{INCI} + \beta_{13}\text{DA} + \beta_{14-24}(\text{IndustryD}) + \beta_{25-30}(\text{YearD}) + \varepsilon$; where Log(Fee), natural logarithm of audit fees paid to the auditor; Log(Assets), natural logarithm of total assets (item 6); Log(Busseg), natural logarithm of the number of business segments reported on the Compustat Segment Data File; Log(Geoseg), natural logarithm of the number of geographic segments reported on the Compustat Segment Data File; Inventory, ratio of the dollar value of inventory (item 3) to beginning balance total assets (item 6); Receivables, ratio of the dollar value of accounts receivables (item 2) to beginning balance total assets (item 6); Debt, sum of short-term debt (item 34) and long-term debt (item 9) to beginning balance total assets (item 6); Income, ratio of operating income after depreciation (item 178) to average total assets (item 6); Loss, indicator variable that is equal to 1 if the firm reports negative income in any of the previous three years, and 0 otherwise; Opinion, indicator variable equal to 1 if the firm receives a going concern opinion, and 0 otherwise; ICP, indicator variable that is equal to 1 if a firm's internal control opinion is "ineffective" and 0 otherwise; Big4, indicator variable equals to 1 if a firm's auditor is a Big4 and 0, otherwise; INCI, indicator variable equal to 1 if DAs are income-increasing, and 0 otherwise; DA, discretionary accruals measured by cross-sectional modified Jones (1991) model; IndustryD, indicator variables for industry adapted from Frankel *et al.* (2002); YearD, indicator variables for years 2001-2006

Table II.
OLS multiple regression

CFOD*Salary*DA, and CFOD*Bonus*DA[9]. However, the sign of these significant coefficients are different indicating the differences of their effect on the relationship between DAs and audit fees. The coefficient of CFOD*Salary*DA is negative indicating that as CFOs salaries increase, the relationship between DAs and audit fees is negative and significant indicating lower audit fees. On the other hand, the coefficient of CFOD*Bonus*DA is significantly positive indicating that the higher the bonuses of the CFO, the relationship between DA and audit fees become even more positive and significant. The main effect coefficient of CFOD is negative and significant at 0.10, Salary is positive

Table III.
OLS multiple regression

	Coefficient	$Pr > \|t\|$
Dependant variable: Log(Fee)		
Intercept	7.92743	< 0.0001
Log(Assets)	0.60139	< 0.0001
Log(Busseg)	0.10799	< 0.0001
Log(Geoseg)	0.15542	< 0.0001
Inventory	0.07669	0.3018
Receivables	1.71786	< 0.0001
Debt	0.21703	< 0.0001
Income	−0.48503	< 0.0001
Loss	0.02779	0.2839
Opinion	0.23779	< 0.0001
Big4	0.15429	< 0.0001
ICP	0.57609	< 0.0001
DA	*−0.00878*	*0.7541*
INCI	*0.06284*	*< 0.0001*
CFOD	−0.0303	0.0803
Salary	0.04808	< 0.0001
Bonus	−0.0043	0.2989
Options	0.000379	0.6929
Restrict	0.00194	0.2175
Ltips	0.02125	0.4393
Salary*DA	0.01245	0.2922
Bonus*DA	0.02987	0.1443
Options*DA	−0.00193	0.3795
Restrict*DA	−0.00141	0.8853
Ltips*DA	−0.02244	0.8329
CFOD*DA	0.01135	0.8172
CFOD*Salary	0.07533	0.0013
CFOD*Bonus	−0.02824	0.5208

(continued)

Table III.

	Coefficient	$Pr > \|t\|$
CFOD*Options	0.00441	0.3564
CFOD*Ltips	0.07206	0.4521
CFOD*Restrict	0.02039	0.5383
*CFOD*Salary*DA*	*− 0.22901*	*0.003*
*CFOD*Bonus*DA*	*0.29727*	*0.0062*
*CFOD*Options*DA*	*0.0145*	*0.4911*
*CFOD*Restrict*DA*	*− 0.23871*	*0.7841*
*CFOD*Ltips*DA*	*0.18094*	*0.24*
YearD	Included	
IndustryD	Included	
n	8187	
Adjusted R^2	0.7704	
F-value ($Pr > F$)	519.11(<0.0001)	

Notes: Test of *H2*, $\text{Log(Fee)} = \beta_0 + \beta_1\text{Log(Assets)} + \beta_2\text{Log(Busseg)} + \beta_3\text{Log(Geoseg)} + \beta_4\text{Inventory} + \beta_5\text{Receivables} + \beta_6\text{Debt} + \beta_7\text{Income} + \beta_8\text{Loss} + \beta_9\text{Opinion} + \beta_{10}\text{ICP} + \beta_{11}\text{Big4} + \beta_{12}\text{INCI} + \beta_{13}\text{DA} + \beta_{14}\text{CFOD} + \beta_{15}\text{Salary} + \beta_{16}\text{Bonus} + \beta_{17}\text{Options} + \beta_{18}\text{Restrict} + \beta_{19}\text{Ltips} + \beta_{20}(\text{Salary}^*\text{DA}) + \beta_{21}(\text{Bonus}^*\text{DA}) + \beta_{22}(\text{Options}^*\text{DA}) + \beta_{23}(\text{Restrict}^*\text{DA}) + \beta_{24}(\text{Ltips}^*\text{DA}) + \beta_{25}(\text{CFOD}^*\text{DA}) + \beta_{26}(\text{CFOD}^*\text{Salary}) + \beta_{27}(\text{CFOD}^*\text{Bonus}) + \beta_{28}(\text{CFOD}^*\text{Options}) + \beta_{29}(\text{CFOD}^*\text{Restrict}) + \beta_{30}(\text{CFOD}^*\text{Ltips}) + \beta_{31}(\text{CFOD}^*\text{Salary}^*\text{DA}) + \beta_{32}(\text{CFOD}^*\text{Bonus}^*\text{DA}) + \beta_{33}(\text{CFOD}^*\text{Options}^*\text{DA}) + \beta_{34}(\text{CFOD}^*\text{Restrict}^*\text{DA}) + \beta_{35}(\text{CFOD}^*\text{Ltips}^*\text{DA}) + \beta_{36-47}(\text{IndustryD}) + \beta_{48-53}(\text{YearD}) + \varepsilon$; Log(Fee), natural logarithm of audit fees paid to the auditor; Log(Assets), natural logarithm of total assets (item 6); Log(Busseg), natural logarithm of the number of business segments reported on the Compustat Segment Data File; Log(Geoseg), natural logarithm of the number of geographic segments reported on the Compustat Segment Data File; Inventory, ratio of the dollar value of inventory (item 3) to beginning balance total assets (item 6); Receivables, ratio of the dollar value of accounts receivables (item 2) to beginning balance total assets (item 6); Debt, sum of short-term debt (item 34) and long-term debt (item 9) to beginning balance total assets (item 6); Income, ratio of operating income after depreciation (item 178) to average total assets (item 6); Loss, indicator variable that is equal to 1 if the firm reports negative income in any of the previous three years, and 0 otherwise; Opinion, indicator variable equal to 1 if the firm receives a going concern opinion, and 0 otherwise; ICP, indicator variable that is equal to 1 if a firm's internal control opinion is "ineffective" and 0 otherwise; Big4, indicator variable equals to 1 if a firm's auditor is a Big4 and 0, otherwise; INCI, indicator variable equal to 1 if DAs are income-increasing, and 0 otherwise; DA, discretionary accruals measured by cross-sectional modified Jones (1991) model; IndustryD, indicator variables for industry adapted from Frankel *et al.* (2002); YearD, indicator variables for years 2001-2006; Salary, salary to annual total assets (item 6); Bonus, bonus to annual total assets(item 6); Options, Black-Scholes options value granted to CFO to annual total assets(item 6); Restrict, restricted stock compensation to annual total assets(item 6); Ltips, long-term incentive plans to annual total assets(item 6); CFOD, indicator variable equals 1 if executive is a CFO, and 0 otherwise; CFOD*Salary*DA, interaction variable of CFOD*Salary and DA; CFOD*Bonus*DA, interaction variable of CFOD*Bonus and DA; CFOD*Options*DA, interaction variable of CFOD*Options and DA; CFOD*Restrict*DA, interaction variable of CFOD*Restrict and DA; CFOD*Ltips*DA, interaction variable of CFOD*Ltips and DA

and significant at 0.01, and coefficients of Bonus and DA are both negative but not significant. The two-variable interactions terms are statistically insignificant, except for CFOD*Salary which is positive and significant at 0.01 level. The three-variable interaction terms results indicate that CFO compensation structure affect differently the relationship between DAs and audit fees. Thus, *H2* is rejected that there are no differences in the effect of CFOs compensation structure on the relationship between DAs and audit fees. The coefficient of INCI is positive and significant at 0.01 level. The coefficient of control variables: Log(Assets), Log(Busseg), Log(Geoseg), Receivable, Debt, Income, Opinion, Big4, and ICP are all in the expected direction and significant at 0.01 or better.

Given the results of the income-increasing accrual variable (INCI), *H1* and *H2* are further retested by separately testing positive and negative DAs. In addition, *H1* and *H2* are retested using small and large firms' and the pre- and post-SOX subsamples[10].

Additional analyses

Income-increasing versus income-decreasing DAs. The study examines the role of income-increasing and income-decreasing accruals. Income-increasing accruals could affect audit fees differently than income-decreasing accruals (Gul *et al.*, 2003). This is because, income-increasing accruals can be perceived by the auditors to be riskier than income decreasing one and thus justifying additional audit work and increase in audit fees as a result (Gul *et al.*, 2003). Therefore, *H1* and *H2* are retested using subsamples of positive only DAs and negative only DAs. Results are reported in Table IV. Table IV shows that for income-increasing DAs, DA is positive and significant at 0.01 level (supporting *H1*). Moreover, for income-increasing accruals, the three-variable interactions of compensation structure and CFOD and DA; the coefficient of (CFOD*Bonus*DA) is positive and significant and the coefficient of (CFOD*Salary*DA) is negative and significant, at 0.01 level. This latter result further rejects *H2* of no differences of the effect of compensation structure on the DAs and audit fee positive relationship. On the other hand, Table IV shows that for income-decreasing accruals, the coefficient of DA is negative and significant at 0.01 level and none of the three-variable interaction terms are significant at conventional levels. Taken together, the results documented in Table IV show that income-increasing DAs increase inherent risk and therefore results in decrease planned detection risk that requires additional audit work and increase in audit fees. Moreover, income-decreasing accruals are associated with lower audit fees supporting the notion of conservative accounting. Moreover, CFO's compensation structure seems to have insignificant effect on this negative relationship between income-decreasing accruals and audit fees.

Size effect. Prior studies suggest firm size is a main determinant in audit fee model (Gul *et al.*, 2003; Hay *et al.*, 2004). Moreover, Skinner (1993) and Gul (2001) in Gul *et al.* (2003) provide that small firms are more likely than large firms to adopt income-increasing accruals. Black (2001) in Gul *et al.* (2003) provides that small firms are more likely to show improvement in past performance than large firms. This is because large firms are followed by more analysts and attract more public attention so that there is lower incentive to use DAs opportunistically (Gul *et al.*, 2003). Using sample median to determine small and large firms, *H1* and *H2* are retested. Results are reported in Table V. Small firms subsample show that DA is positive but insignificant and that INCI is positive and significant at 0.10 level. The coefficients of the three-variable interaction terms is statistically not significant except for the coefficient of (CFOD*Salary*DA) is negative

Table IV. Income-increasing versus income-decreasing DAs

	Income-increasing DAs		Income-decreasing DAs	
	Coefficient	*Pr* > |*t*|	Coefficient	*Pr* > |*t*|
Dependant variable: Log(Fee)				
Intercept	7.70904	< 0.0001	8.0209	< 0.0001
Log(Assets)	0.61822	< 0.0001	0.60399	< 0.0001
Log(Busseg)	0.1127	< 0.0001	0.07758	< 0.0001
Log(Geoseg)	0.15473	< 0.0001	0.17322	< 0.0001
Inventory	0.05583	0.5386	0.18216	0.1894
Receivables	1.70829	< 0.0001	2.12097	< 0.0001
Debt	0.26192	< 0.0001	0.12421	0.0985
Income	−0.4856	< 0.0001	−0.59366	0.0003
Loss	0.01835	0.5356	0.02333	0.6859
Opinion	0.29588	< 0.0001	−0.04836	0.733
Big4	0.20616	< 0.0001	0.00977	0.8537
ICP	0.61078	< 0.0001	0.5613	< 0.0001
DA	*0.08375*	*0.0115*	*−0.32795*	*< 0.0001*
CFOD	0.01094	0.6268	−0.03737	0.2827
Salary	0.09575	< 0.0001	0.07197	0.0001
Bonus	−0.00035	0.9727	0.01136	0.5274
Options	−0.00123	0.5151	0.0012	0.6994
Restrict	−0.00744	0.0144	0.02306	0.0514
Ltips	0.05257	0.1263	0.06975	0.3485
Salary*DA	−0.05244	0.0139	0.04178	0.2871
Bonus*DA	0.06287	0.066	0.19672	0.085
Options*DA	−0.0012	0.8392	−0.00079	0.8908
Restrict*DA	0.08442	0.0023	0.01587	0.3529
Ltips*DA	−0.14538	0.2033	0.90996	0.6864
CFOD*DA	−0.07274	0.1946	0.21864	0.1874
CFOD*Salary	0.08029	0.007	−0.00192	0.976
CFOD*Bonus	−0.05668	0.3362	0.03994	0.7149
CFOD*Options	0.00681	0.3538	0.0025	0.9148

(*continued*)

Table IV.

	Income-increasing DAs		Income-decreasing DAs	
	Coefficient	$Pr > \|t\|$	Coefficient	$Pr > \|t\|$
CFOD*Ltips	0.09865	0.4296	0.14612	0.5995
CFOD*Restrict	0.01776	0.7274	0.00964	0.8719
*CFOD*Salary*DA*	*− 0.23647*	*0.0072*	*− 0.34676*	*0.6636*
*CFOD*Bonus*DA*	*0.35245*	*0.0046*	*0.18876*	*0.8707*
*CFOD*Options*DA*	*0.00584*	*0.8364*	*0.00634*	*0.9674*
*CFOD*Restrict*DA*	*0.18101*	*0.3553*	*− 0.48772*	*0.4032*
*CFOD*Ltips*DA*	*− 0.4952*	*0.6155*	*0.76259*	*0.9407*
YearD	Included		Included	
IndustryD	Included		Included	
n	5758		2090	
Adjusted R^2	0.7702		0.7804	
F-value ($Pr > F$)	372.05 (<0.0001)		143.75 (<0.0001)	

Notes: $\text{Log(Fee)} = \beta_0 + \beta_1\text{Log(Assets)} + \beta_2\text{Log(Busseg)} + \beta_3\text{Log(Geoseg)} + \beta_4\text{Inventory} + \beta_5\text{Receivables} + \beta_6\text{Debt} + \beta_7\text{Income} + \beta_8\text{Loss} + \beta_9\text{Opinion} + \beta_{10}\text{ICP} + \beta_{11}\text{Big4} + \beta_{12}\text{DA} + \beta_{13}\text{CFOD} + \beta_{14}\text{Salary} + \beta_{15}\text{Bonus} + \beta_{16}\text{Options} + \beta_{17}\text{Restrict} + \beta_{18}\text{Ltips} + \beta_{19}(\text{Salary}^*\text{DA}) + \beta_{20}(\text{Bonus}^*\text{DA}) + \beta_{21}(\text{Options}^*\text{DA}) + \beta_{22}(\text{Restrict}^*\text{DA}) + \beta_{23}(\text{Ltips}^*\text{DA}) + \beta_{24}(\text{CFOD}^*\text{DA}) + \beta_{25}(\text{CFOD}^*\text{Salary}) + \beta_{26}(\text{CFOD}^*\text{Bonus}) + \beta_{27}(\text{CFOD}^*\text{Options}) + \beta_{28}(\text{CFOD}^*\text{Restrict}) + \beta_{29}(\text{CFOD}^*\text{Ltips}) + \beta_{30}(\text{CFOD}^*\text{Salary}^*\text{DA}) + \beta_{31}(\text{CFOD}^*\text{Bonus}^*\text{DA}) + \beta_{32}(\text{CFOD}^*\text{Options}^*\text{DA}) + \beta_{33}(\text{CFOD}^*\text{Restrict}^*\text{DA}) + \beta_{34}(\text{CFOD}^*\text{Ltips}^*\text{DA}) + \beta_{35-46}(\text{IndustryD}) + \beta_{47-52}(\text{YearD}) + \varepsilon$; Log(Fee), natural logarithm of audit fees paid to the auditor; Log(Assets), natural logarithm of total assets (item 6); Log(Busseg), natural logarithm of the number of business segments reported on the Compustat Segment Data File; Log(Geoseg), natural logarithm of the number of geographic segments reported on the Compustat Segment Data File; Inventory, ratio of the dollar value of inventory (item 3) to beginning balance total assets (item 6); Receivables, ratio of the dollar value of accounts receivables (item 2) to beginning balance total assets (item 6); Debt, sum of short-term debt (item 34) and long-term debt (item 9) to beginning balance total assets (item 6); Income, ratio of operating income after depreciation (item 178) to average total assets (item 6); Loss, indicator variable that is equal to 1 if the firm reports negative income in any of the previous three years, and 0 otherwise; Opinion, indicator variable equal to 1 if the firm receives a going concern opinion, and 0 otherwise; ICP, indicator variable that is equal to 1 if a firm's internal control opinion is "ineffective" and 0 otherwise; Big4, indicator variable equals to 1 if a firm's auditor is a Big4 and 0, otherwise; DA, discretionary accruals measured by cross-sectional modified Jones (1991) model; IndustryD, indicator variables for industry adapted from Frankel *et al.* (2002); YearD, indicator variables for years 2001-2006; Salary, salary to annual total assets (item 6); Bonus, bonus to annual total assets(item 6); Options, Black-Scholes options value granted to CFO to annual total assets(item 6); Restrict, restricted stock compensation to annual total assets(item 6); Ltips, long-term incentive plans to annual total assets(item 6); CFOD, indicator variable equals 1 if executive is a CFO, and 0 otherwise; CFOD*Salary*DA, interaction variable of CFOD* Salary and DA; CFOD*Bonus*DA, interaction variable of CFOD*Bonus and DA; CFOD*Options*DA, interaction variable of CFOD*Options and DA; CFOD*Restrict*DA, interaction variable of CFOD*Restrict and DA; CFOD*Ltips*DA, interaction variable of CFOD* Ltips and DA

Table V. Small versus large firms subsample tests

	Small firms		Large firms	
	Coefficient	*Pr* > |*t*|	Coefficient	*Pr* > |*t*|
Dependant variable: Log(Fee)				
Intercept	8.94656	<0.0001	6.29098	<0.0001
Log(Assets)	0.4669	<0.0001	0.73617	<0.0001
Log(Busseg)	0.07284	<0.0001	0.12104	<0.0001
Log(Geoseg)	0.11094	<0.0001	0.21881	<0.0001
Inventory	0.04554	0.6043	0.18234	0.1764
Receivables	1.48841	<0.0001	2.46668	<0.0001
Debt	0.10021	0.0227	0.69284	<0.0001
Income	−0.49286	<0.0001	−0.6632	<0.0001
Loss	0.0446	0.1533	−0.1409	0.002
Opinion	0.25648	0.001	0.27317	0.0005
Big4	0.24516	<0.0001	0.07825	0.0552
ICP	0.45492	<0.0001	0.72617	<0.0001
DA	*0.05067*	*0.2277*	*0.20069*	*0.0363*
INCI	*0.03684*	*0.0772*	*0.04774*	*0.0221*
CFOD	−0.04572	0.0896	0.04682	0.1911
Salary	0.01025	0.1931	0.93708	<0.0001
Bonus	0.00127	0.7637	−0.02694	0.4823
Options	−0.00073	0.4628	0.00775	0.1011
Restrict	0.00208	0.1852	0.0115	0.5542
Ltips	0.02098	0.5416	−0.00653	0.899
Salary*DA	−0.00638	0.6096	−1.34144	0.0009
Bonus*DA	0.02202	0.2884	0.73118	0.0001
Options*DA	−0.00148	0.5005	−0.03525	0.3938
Restrict*DA	−0.00483	0.6232	0.10151	0.4411
Ltips*DA	0.0784	0.7025	−0.13634	0.3852
CFOD*DA	0.20125	0.0769	−0.10711	0.534
CFOD*Salary	0.02594	0.3068	0.69303	0.0205
CFOD*Bonus	−0.00714	0.8759	−0.51443	0.0088

(continued)

Table V.

	Small firms		Large firms	
	Coefficient	$Pr > \|t\|$	Coefficient	$Pr > \|t\|$
CFOD*Options	0.00396	0.414	0.02829	0.3386
CFOD*Ltips	0.08124	0.4166	0.37248	0.3291
CFOD*Restrict	0.02861	0.4169	0.19584	0.0703
*CFOD*Salary*DA*	*− 0.23244*	*0.0039*	*− 1.43255*	*0.4195*
*CFOD*Bonus*DA*	*0.18263*	*0.1084*	*2.25316*	*0.0274*
*CFOD*Options*DA*	*0.008*	*0.7225*	*− 0.03608*	*0.8919*
*CFOD*Restrict*DA*	*0.11999*	*0.4557*	*− 0.56478*	*0.5475*
*CFOD*Ltips*DA*	*− 0.33865*	*0.7156*	*− 2.1267*	*0.4284*
YearD	Included		Included	
IndustryD	Included		Included	
n	4400		3787	
Adjusted R^2	0.6089		0.7303	
F-value ($Pr > F$)	127.65 (<0.0001)		194.41 (<0.0001)	

Notes: Log(Fee) = $\beta_0 + \beta_1$Log(Assets) + β_2Log(Busseg) + β_3Log(Geoseg) + β_4Inventory + β_5Receivables + β_6Debt + β_7Income + β_8Loss+ β_9Opinion + β_{10}ICP + β_{11}Big4 + β_{12}INCI + β_{13}DA + β_{14}CFOD + β_{15}Salary + β_{16}Bonus + β_{17}Options + β_{18}Restrict + β_{19}Ltips + β_{20}(Salary*DA)+ β_{21}(Bonus*DA)+β_{22}(Options*DA)+β_{23}(Restrict*DA)+β_{24}(Ltips*DA)+β_{25}(CFOD*DA)+β_{26}(CFOD*Salary)+β_{27}(CFOD*Bonus)+β_{28}(CFOD*Options)+ β_{29}(CFOD*Restrict) + β_{30}(CFOD*Ltips) + β_{31}(CFOD*Salary*DA) + β_{32}(CFOD*Bonus*DA) + β_{33}(CFOD*Options*DA) + β_{34}(CFOD*Restrict*DA) + β_{35}(CFOD*Ltips*DA) + β_{36-47}(IndustryD)+ β_{48-53}(YearD) + ε; Log(Fee), natural logarithm of audit fees paid to the auditor; Log(Assets), natural logarithm of total assets (item 6); Log(Busseg), natural logarithm of the number of business segments reported on the Compustat Segment Data File; Log(Geoseg), natural logarithm of the number of geographic segments reported on the Compustat Segment Data File; Inventory, the ratio of the dollar value of inventory (item 3) to beginning balance total assets (item 6); Receivables, ratio of the dollar value of accounts receivables (item 2) to beginning balance total assets (item 6); Debt, sum of short-term debt (item 34) and long-term debt (item 9) to beginning balance total assets (item 6); Income, ratio of operating income after depreciation (item 178) to average total assets (item 6); Loss, indicator variable that is equal to 1 if the firm reports negative income in any of the previous three years, and 0 otherwise; Opinion, indicator variable equal to 1 if the firm receives a going concern opinion, and 0 otherwise; ICP, indicator variable that is equal to 1 if a firm's internal control opinion is "ineffective" and 0 otherwise; Big4, indicator variable equals to 1 if a firm's auditor is a Big4 and 0, otherwise; INCI, indicator variable equal to 1 if DAs are income-increasing, and 0 otherwise; DA, discretionary accruals measured by cross-sectional modified Jones (1991) model; IndustryD, indicator variables for industry adapted from Frankel *et al.* (2002); YearD, indicator variables for years 2001-2006; Salary, salary to annual total assets (item 6); Bonus the bonus to annual total assets(item 6); Options, Black-Scholes options value granted to CFO to annual total assets(item 6); Restrict, restricted stock compensation to annual total assets(item 6); Ltips, long-term incentive plans to annual total assets(item 6); CFOD, indicator variable equals 1 if executive is a CFO, and 0 otherwise; CFOD*Salary*DA, interaction variable of CFOD*Salary and DA; CFOD*Bonus*DA, interaction variable of CFOD*Bonus and DA; CFOD*Options*DA, interaction variable of CFOD*Options and DA; CFOD*Restrict*DA, interaction variable of CFOD*Restrict and DA; CFOD*Ltips*DA, interaction variable of CFOD* Ltips and DA

and significant at 0.01 level indicating that large CFO's salary is associated with a reduction in the positive relationship between DA and audit fees for small firms. On the other hand, large firm subsample shows that DA is positive and significant at 0.05 level and that INCI is positive and significant at 0.05 level indicating that large firms have higher DAs that are associated with higher audit fees. In addition, the coefficient of (CFOD*Bonus*DA) is positive and significant at 0.05 level suggesting that for large firms, higher bonus increases managerial opportunistic behavior that is associated with increase in inherent risk and thus increase in audit fees. These results conflict with prior studies (Gul *et al.*, 2003).

SOX effect. SOX requires CFOs and CEOs to certify whether that the annual and quarterly reports present fairly in all material respects the financial condition and the results of operations of the firm. SOX also subject both the CFO and the CEO to penalties if they knowingly falsely certify the financial statements (SOX, 2002 in Hoitash *et al.*, 2009). To examine the effect of SOX on the CFO compensation structure effect on the relationship between DAs and audit fees, the sample is split into the pre-SOX ($n = 3{,}049$) and the post-SOX. ($n = 5{,}138$). Table VI provides the estimation results of re-testing *H1* and *H2* using the pre- and post-SOX subsamples.

Table VI shows that DAs and INCI are positive and significant at 0.10 and 0.05 levels, respectively, in the pre-SOX period subsample. Salary and Bonus are significantly positive and insignificantly negative, respectively, in the pre-SOX period. All the three-term interaction variables are not significant at conventional levels in the pre-SOX period. In addition, DAs in the post-SOX period subsample is positive and significant at 0.01 level and the magnitude of the coefficient is in multiple of the magnitude of the DAs in the pre-SOX period. INCI is positive but is not significant in the post-SOX period subsample. The coefficient of Salary is positive and significant at the 0.01 level and the coefficient of CFOD*Salary*DA is negative and significant at 0.05 level suggesting that in the post-SOX period subsample, the increase in CFO's salary is associated with a reduction in the positive association between DAs and audit fees. The coefficient of Bonus is positive but not significant and the coefficient of CFOD*Bonus*DA is positive but not significant and the magnitude of this coefficient (even though not statistically significant) is larger than the corresponding coefficient in the pre-SOX period subsample.

Moreover, the coefficient of Options is positive and significant at 0.01 level and the coefficient of CFOD*Options*DA is positive and significant at 0.05 level suggesting that in the post-SOX period, an increase in CFO's options are associated with increase in the positive relationship between DAs and audit fees. The overall results of pre- and post-SOX periods show that unexpectedly, there is insignificant effect of CFO's compensation structure on the relationship between DAs and audit fees in the pre-SOX period. In addition, the effect of increased salaries of CFOs has a moderating effect on the relationship between DAs and audit fees, while bonuses show no significant increase in this relationship and bonuses further intensify the positive association between DAs and audit fees in the post-SOX period.

6. Conclusions

This study examines the effect of CFOs compensation structure on the relationship between DAs and audit fees. It is hypothesized that there is a positive association between DAs and audit fees that is driven by increase in inherent risk due to nature of accounting items used to calculate DAs and that CFO's compensation structure have

Table VI.
Pre- versus post-sarbanes Oxley subsample tests

	Pre-SOX		Post-SOX	
	Coefficient	*Pr* > |*t*|	Coefficient	*Pr* > |*t*|
Dependant variable: Log(Fee)				
Intercept	7.4823	<0.0001	8.06839	<0.0001
Log(Assets)	0.61809	<0.0001	0.59128	<0.0001
Log(Busseg)	0.11343	<0.0001	0.10081	<0.0001
Log(Geoseg)	0.25272	<0.0001	0.2375	<0.0001
Inventory	0.36088	0.0001	−0.238	0.0009
Receivables	1.90842	<0.0001	2.0888	<0.0001
Debt	0.10814	0.0876	0.31014	<0.0001
Income	−0.45517	0.0009	−0.95297	<0.0001
Loss	0.05747	0.1813	−0.06197	0.0772
Opinion	0.23661	0.0132	0.21318	0.0013
Big4	0.09671	0.0008	0.28029	<0.0001
ICP			0.52932	<0.0001
DA	*0.16116*	*0.0744*	*0.27641*	*0.0068*
INCI	*0.06064*	*0.0238*	*0.01389*	*0.4749*
CFOD	−0.01893	0.5973	0.00346	0.8894
Salary	0.1498	<0.0001	0.12577	<0.0001
Bonus	−0.01653	0.5343	−0.0051	0.7964
Options	0.00439	0.2962	0.01419	0.001
Restrict	0.00408	0.9046	0.06855	0.0004
Ltips	0.40466	0.0263	0.03885	0.7172
Salary*DA	−0.03381	0.5971	−0.12997	0.0201
Bonus*DA	0.01225	0.9213	0.12993	0.1511
Options*DA	0.01777	0.4093	−0.00848	0.6423
Restrict*DA	0.15439	0.3768	−0.02567	0.7856
Ltips*DA	−0.66288	0.3112	−0.31153	0.6561
CFOD*DA	−0.07679	0.6408	0.04694	0.7685
CFOD*Salary	0.11824	0.074	0.04557	0.1896
CFOD*Bonus	−0.00371	0.804	0.01306	0.3316
CFOD*Options	−0.07105	0.4551	0.02519	0.6737

(*continued*)

Table VI.

	Pre-SOX		Post-SOX	
	Coefficient	$Pr > \|t\|$	Coefficient	$Pr > \|t\|$
CFOD*Ltips	−0.07842	0.8643	−0.04944	0.8489
CFOD*Restrict	−0.11308	0.3686	0.02184	0.68
*CFOD*Salary*DA*	*−0.03271*	*0.8624*	*−0.31127*	*0.0212*
*CFOD*Bonus*DA*	*0.17367*	*0.6093*	*0.24008*	*0.3544*
*CFOD*Options*DA*	*0.01417*	*0.802*	*0.12642*	*0.0561*
*CFOD*Restrict*DA*	*0.27162*	*0.5598*	*0.1474*	*0.5898*
*CFOD*Ltips*DA*	*0.92307*	*0.7377*	*−2.1492*	*0.3529*
YearD	Included		Included	
IndustryD	Included		Included	
n	3049		5138	
Adjusted R^2	0.7137		0.7433	
F-value ($Pr > F$)	206.34 (<0.000)		382.42 (<0.000)	

Notes: $\text{Log(Fee)} = \beta_0 + \beta_1\text{Log(Assets)} + \beta_2\text{Log(Busseg)} + \beta_3\text{Log(Geoseg)} + \beta_4\text{Inventory} + \beta_5\text{Receivables} + \beta_6\text{Debt} + \beta_7\text{Income} + \beta_8\text{Loss} + \beta_9\text{Opinion} + \beta_{10}\text{ICP} + \beta_{11}\text{Big4} + \beta_{12}\text{INCI} + \beta_{13}\text{DA} + \beta_{14}\text{CFOD} + \beta_{15}\text{Salary} + \beta_{16}\text{Bonus} + \beta_{17}\text{Options} + \beta_{18}\text{Restrict} + \beta_{19}\text{Ltips} + \beta_{20}(\text{Salary}^*\text{DA}) + \beta_{21}(\text{Bonus}^*\text{DA}) + \beta_{22}(\text{Options}^*\text{DA}) + \beta_{23}(\text{Restrict}^*\text{DA}) + \beta_{24}(\text{Ltips}^*\text{DA}) + \beta_{25}(\text{CFOD}^*\text{DA}) + \beta_{26}(\text{CFOD}^*\text{Salary}) + \beta_{27}(\text{CFOD}^*\text{Bonus}) + \beta_{28}(\text{CFOD}^*\text{Options}) + \beta_{29}(\text{CFOD}^*\text{Restrict}) + \beta_{30}(\text{CFOD}^*\text{Ltips}) + \beta_{31}(\text{CFOD}^*\text{Salary}^*\text{DA}) + \beta_{32}(\text{CFOD}^*\text{Bonus}^*\text{DA}) + \beta_{33}(\text{CFOD}^*\text{Options}^*\text{DA}) + \beta_{34}(\text{CFOD}^*\text{Restrict}^*\text{DA}) + \beta_{35}(\text{CFOD}^*\text{Ltips}^*\text{DA}) + \beta_{36-47}(\text{IndustryD}) + \beta_{48-53}(\text{YearD}) + \varepsilon$; Log(Fee), natural logarithm of audit fees paid to the auditor; Log(Assets), natural logarithm of total assets (item 6); Log(Busseg), natural logarithm of the number of business segments reported on the Compustat Segment Data File; Log(Geoseg), natural logarithm of the number of geographic segments reported on the Compustat Segment Data File; Inventory, ratio of the dollar value of inventory (item 3) to beginning balance total assets (item 6); Receivables, ratio of the dollar value of accounts receivables (item 2) to beginning balance total assets (item 6); Debt, sum of short-term debt (item 34) and long-term debt (item 9) to beginning balance total assets (item 6); Income, ratio of operating income after depreciation (item 178) to average total assets (item 6); Loss, indicator variable that is equal to 1 if the firm reports negative income in any of the previous three years, and 0 otherwise; Opinion, indicator variable equal to 1 if the firm receives a going concern opinion, and 0 otherwise; ICP, indicator variable that is equal to 1 if a firm's internal control opinion is "ineffective" and 0 otherwise; Big4, indicator variable equals to 1 if a firm's auditor is a Big4 and 0, otherwise; INCI, indicator variable equal to 1 if DAs are income-increasing, and 0 otherwise; DA, discretionary accruals measured by cross-sectional modified Jones (1991) model; IndustryD, indicator variables for industry adapted from Frankel *et al.* (2002); YearD, indicator variables for years 2001-2006 and they differ by each subsample; Salary, salary to annual total assets (item 6); Bonus, bonus to annual total assets(item 6); Options, Black-Scholes options value granted to CFO to annual total assets(item 6); Restrict, restricted stock compensation to annual total assets(item 6); Ltips, long-term incentive plans to annual total assets(item 6); CFOD, indicator variable equals 1 if executive is a CFO, and 0 otherwise; CFOD*Salary*DA, interaction variable of CFOD*Salary and DA; CFOD*Bonus*DA, interaction variable of CFOD*Bonus and DA; CFOD*Options*DA, interaction variable of CFOD*Options and DA; CFOD*Restrict*DA, interaction variable of CFOD*Restrict and DA; CFOD*Ltips*DA, interaction variable of CFOD*Ltips and DA. By definition, ICP variable is not available in the Pre-Sox period; the model is estimated without this variable

different effects on the expected positive relationship between DAs and audit fees. Using a large recent sample of CEO/CFO compensation data over the period 2000-2006, a positive and significant relationship is found between DAs and audit fees. In addition, results show that CFO's salary has a moderating effect on the relationship between DAs and audit fees and that CFO's bonuses are associated with stronger positive association between DAs and audit fees.

Moreover, results show that only income-increasing DAs are associated with higher audit fees and that this latter relationship is more significant as CFOs bonuses increase and that this latter relationship is reduced significantly as CFOs salaries increase. Additionally, the positive relationship between DAs and audit fees is significantly driven by CFOs bonuses of large firms. The positive relationship between DAs and audit fees are reduced by CFOs salaries of small firms. There is inconclusive evidence however using pre- and post-SOX subsamples. However, data show options as oppose to bonuses intensify the positive relationship between DAs and audit fees in the post-SOX period.

The results have practical and regulatory implications on the part of the audit work and executive compensation structure policies. The results support the recent calls for executive compensation reforms to mitigate risk taking and to provide the right incentives. The study also shows that auditor may look at the compensation structure as a common practice when assessing risk of material misstatement in the financial statements. The results however are limited to the pre-financial crisis period and as such, new analyses can be done to examine how during the financial crisis, executive compensation structure affects the relationship between DAs and audit fees.

Notes

1. Audit risk model is required to be used at the planning stage of financial statements audit. SAS 39 (American Institute of Certified Public Accountants (AICPA, 1981)) and SAS 41 (AICPA, 1983) provide the requirement and components. The audit risk model is the Planned Detection Risk = Acceptable Audit Risk/Inherent Risk*Control Risk.
2. Classical study by Houghton and Fogarty (1991) indicates that inventory and accounts receivable have high inherent risk so more audit work is required. Similar conclusions are presented in auditing textbooks such as Arens *et al.* (2008).
3. Gul *et al.* (2003) assert the difficulty to determine if executive compensation is accounting-based or not. However, they suggest the use of total assets as scaler for compensation variables to mitigate this lack of knowledge.
4. Gul *et al.* (2003) also show that managerial ownership moderates the positive relationship between management compensation and audit fees. Owing to data availability and statistical limitation on the number of variables to include in the test model, this study does not include managerial ownership in the models.
5. Jiang *et al.* (2009) and Gul *et al.* (2003) present a comprehensive literature review; please refer to these studies for details.
6. Year 2000 is used as starting point because audit fees are available from that year in Audit Analytics. The sample stops at 2006 due to availability of compensation data until that year.
7. CFO data include CFO, controller, or treasurer for that particular company and does not include CEOs or CFOs of a subsidiary or an affiliate.
8. Average Ltip to total asset is 0.000036955.

9. Variance inflation factors (VIF) are used to test for multicollinearity between the independent variables. Except for "Restrict" variable and its interactions that have VIFs ranging from 12 to 17, all other VIFs are less than 10. Remedial steps are examined, such as ridge regression and findings show that there is no further reduction in the sum squared errors resulted as such the ridge regression estimates are not reported. A model of centered-scored regression (mean deviations) is attempted but as Katrichis (1992) argues that this technique produces systematically biased estimates of main effects. In addition, Kromrey and Foster-Johnson (1998) assert that the results of centered and non-centered regression models are almost identical. Therefore, only the OLS regression results are reported.
10. The income-increasing and income-decreasing subsamples and size, pre- and post-SOX subsamples are obtained from CEO/CFO subsample. The income-increasing (positive only DAs) includes 5,758 observations and the income-decreasing (negative only DAs) includes 2,090 observations. Small (large) firms are defined as those with log of total assets of less than or equal to (greater than) sample median 7.166806. This resulted in small firms to include 4,400 observations and large firms to include 3,787 observations.

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Corresponding author

Fatima Alali can be contacted at: falali@fullerton.edu