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Impact of audit quality on the components of executive cash compensation

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Abstract

Purpose – This paper aims to study the impact of audit quality on the components of executive cash compensation. It is predicted that as audit quality improves, greater emphasis will be placed on the incentive components of cash compensation, and lower emphasis on the salary (fixed) component. Specifically, it is predicted that as audit quality enhances, greater emphasis will be placed on earnings and sales revenues in determining executive cash compensation. Using auditor specialization as a proxy for audit quality, empirical support is provided for all of our predictions.

Design/methodology/approach – This paper provides empirical support with agency theoretic predictions.

Findings – This paper developed the following hypotheses: *H1* – in executive cash compensation, more weight is being placed on earnings-based measures as auditor specialization improves; *H2* – in executive cash compensation, more weight is also being placed on sales revenues as auditor specialization improves; *H3* – in executive cash compensation, salary levels decrease as auditor specialization improves; and *H4* – the impact of auditor specialization on the weight on earnings, sales and the salary levels is lower in the post-Sarbanes–Oxley Act (SOX) period compared to pre-SOX period.

Research limitations/implications – First, the article limits itself to cash compensation, while current executive compensation is largely made of equity. Second, the measure of audit quality used, 'national level auditor specialization', may not be as effective in the post-SOX era.

Practical implications – Compensation committees should pay attention to audit quality (in whatever way it may be proxied by) in determining executive compensation.

Originality/value – This is the first paper to show that audit quality not only improves the earnings response coefficient in firm valuation but also enhances the weight placed on earnings (and sales revenues) in executive compensation.

Keywords Performance, Organizational theory, Performance measures, Executive compensation

Paper type Research paper

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1. Introduction

Research has established that higher-quality auditors receive a fee premium (Crawswell *et al.*, 1995) and that they positively affect firm parameters such as earnings quality and earnings response coefficients (Balsam *et al.*, 2003; Krishnan, 2003). However, the impact of audit quality on the agency aspects of a firm has not been adequately studied. Accordingly, in this paper, we investigate the impact of audit quality on executive compensation.

Motivating executives to take actions congruent with the goals of their organization has been an important area of accounting research (Lambert and Larcker, 1987; Sloan, 1993; Murphy, 1999; Conyon, 2006). It is well accepted that performance-based compensation is an effective way of obtaining such goal congruence (Jensen and Meckling, 1976; Murphy, 1999). Accounting measures of performance, most notably earnings, are widely used in compensation contracts to link pay to performance (Lambert, 1993).

However, sales revenues and accounting earnings can be easily manipulated by the management (Dechow *et al.*, 1995). In fact Healy (1985) finds that executives engage in earnings management specifically to impact their incentive payments. However, the presence of an external auditor can assure the quality of earnings and increase shareholder faith in the earnings number. Prior research confirms that higher-quality audit indeed corresponds to a lower level of earnings management, and thus, a higher quality of earnings (Becker *et al.*, 1998).

The improvement in earnings quality, according to agency theory, should make the earnings measure more attractive for contracting purposes. Hence, we argue that enhancement in audit quality will cause firms to place a greater emphasis on earnings-based measures in executive compensation. We also argue that the impact of audit quality will be more pronounced in some components of earnings, particularly that of revenues. As such, we predict that enhancement in audit quality will cause firms to place a greater weight on sales revenues as well. Furthermore, we predict that greater reliance on incentive compensation and increased auditor scrutiny will correspond with lower levels of non-incentive compensation.

Prior research shows that specialist auditors perform a higher-quality[1] audit than non-specialist auditors (Krishnan, 2003; Balsam *et al.*, 2003). Accordingly, we use national-level auditor specialization as a measure of audit quality in testing our predictions, and find empirical support for all our predictions. Finally, we argue, and find support, that the associations that we have predicted with auditor specialization would be lower in the post-Sarbanes–Oxley Act (SOX) period.

The rest of the paper is structured as follows. Section 2 contains the literature review. Section 3 develops the hypotheses, and Section 4 describes the data and research methodology. Section 5 analyzes the empirical data and Section 6 concludes the paper.

2. Literature review

In the modern business environment, the functions of ownership and management are separate. In such circumstances, classic agency theory implies that shareholders (principal) can get the manager (agent) to maximize the principal's utility through monitoring and incentive compensation (Jensen and Meckling, 1976). There have been many articles in the financial press regarding pay for performance and the perceived excesses in CEO and other executive compensation (Mullaney, 2015; Willingham, 2016)[2]. In other words, executive compensation has been a matter of utmost interest to academics, practitioners, regulators and the public.

There is an extensive stream of literature that empirically analyzes the sensitivity of executive compensation to firm performance. Smith and Watts (1982) state that incentive

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plans explicitly link CEO's performance to changes in firm value. They also state that cash incentives are tied ex-ante to some measure of firm profit. Lambert and Larcker (1987) analyze a sample of firms from the Forbes annual compensation survey for the period 1970-1984 and show that profits are strongly related to cash compensation. Jensen and Murphy (1990) show that CEO compensation is directly proportional to increases in shareholder wealth, and that the pay increases by $3.50 for every $1,000 increase in shareholder wealth. Sloan (1993) investigates the relative weights placed on earnings and stock returns in CEO cash compensation and shows that the relative weights depend on the noise and correlation between the two signals. More recently, Core *et al.* (2003) document the positive relationship between earnings and CEO compensation.

Executive compensation broadly consists of three components, namely, base salary, bonus and equity. Of these, base salary and bonus are generally paid in cash, and equity in stock options and warrants (Murphy, 1999; Conyon, 2006). The incentives for cash compensation and equity compensation are quite different. Cash compensation is generally linked to past performance because bonuses are mostly linked to the prior period's accounting numbers (Murphy, 1999). Hence, cash compensation shows a strong positive relationship to accounting numbers (Lambert and Larcker, 1987; Sloan, 1993). This indicates that the cash component of executive compensation, in essence, is a reward for past performance. On the other hand, much theoretical work hypothesizes that equity compensation rewards future performance and is intended to induce risk-averse managers to take risks on behalf of shareholders (Jensen and Meckling, 1976; Copeland *et al.*, 2005, p. 487; Murphy, 1999). Equity compensation, by tying the managers' compensation directly to increases in the stock price, will provide incentives for the managers to maximize shareholder wealth (Core *et al.*, 2003; Hanlon *et al.*, 2003). Hence, it is apparent that equity compensation is a method to induce risk taking by the managers (Smith and Watts, 1992; Rajgopal and Shevlin, 2002; Hanlon *et al.*, 2003).

Lewellen *et al.* (1987, p. 289) explicitly state this dichotomy in the CEO compensation:

> Consider first, the role of immediate forms of compensation - salary and current bonus[3]- in the pay package. By whatever formula these payments are established, the payoff to the executive/recipient necessarily reflects only the firm's revealed performance up to the payment date; the amounts involved are fixed when awarded and as received are independent of the firm's subsequent performance. Moreover, bonus awards are typically based on short-term performance measures such as current year profits or return on equity. The time horizon relevant to shareholders however is in principle unlimited since all future residual cashflows the firm is expected to generate should be impounded in share prices. Managers therefore may need to be given an explicit claim to those future cash flows in order to encourage proper attention to decisions that will favorably affect them. This can be accomplished either by conveying to managers an equity interest in the firm through some type of restricted stock compensation or by deferring a portion of cash compensation.

This leads us to conclude that current earnings will be important mainly in determining incentive cash compensation.

If earnings are used to reward managers, then managers will be tempted to "manage" earnings to boost their income. Healy (1985) shows that managers mange earnings both upwards and downwards depending on how their bonuses will be affected. Cheng and Warfield (2005) find that firms where executives receive higher incentive compensation are also associated with earnings that barely meet earnings forecasts (an indication of earnings management). Efendi *et al.* (2007) state that the probability of financial restatements increases when CEOs have been granted large amounts of equity compensation. Bergstresser and Philippon (2006) show that CEOs whose compensation is more sensitive to stock prices, engage in aggressive accruals manipulation to boost stock prices.

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Earnings quality is the degree to which reported earnings will correspond to actual or "Hicksian" earnings (Schipper and Vincent, 2003). If earnings are used to reward and/or incentivize managers, compensation committees will rely more on better-quality earnings in determining executive compensation (Carter *et al.*, 2009). Thus, the earnings quality will be more important in determining cash compensation than equity compensation. Because earnings quality is positively associated with audit quality (Becker *et al.*, 1998; Balsam *et al.*, 2003), we posit that audit quality will increase the impact of earnings-based measures in executive cash compensation. Equity compensation is intended to encourage future performance, and past earnings should not have an impact on equity compensation. Therefore, we do not expect audit quality to have any significant impact on equity compensation.

3. Hypotheses development

Agency theory states that performance-based incentives can reduce the agency problem. However, accounting-based performance measures, which are extensively used in executive compensation, can be easily manipulated by the managers. In fact, research shows that managers manipulate earnings for the specific purpose of influencing their bonus payments. Healy (1985), in a seminal study, finds that managers will manage earnings around bonus caps. Hence, if the earnings go above the cap, the managers will manage earnings downwards[4]. These results have been validated by subsequent research such as Gaver *et al.* (1995) and Holthausen *et al.* (1995).

Auditors provide three roles in a free market, namely, assurance, information and insurance (Wallace, 1980). The assurance role means that they verify the reliability of the financial information prepared by the firm's insiders. The information role means an audited financial report has higher quality compared to an unaudited one, and that investors value an audited report more. DeAngelo's (1981) definition of audit quality indicates that a higher-quality auditor is able to generate more reliable and more informative financial reports. Defond and Zhang (2014, p. 275) define audit quality as "greater assurance of high financial reporting quality". Knechel *et al.* (2013), on the other hand, adopt a situationally variable definition of audit quality. They expand the definition to encompass the "different attributes (uniqueness, process, uncertainty, and judgment) […] as well as […] different aspects (inputs, process, outcomes, and context) of an audit" (pp. 406-407). Therefore, when compensation committees determine executive compensation, they are more likely to rely on the financial statements audited by higher-quality auditors than on those of low-quality auditors. According to agency theory, the use of higher-quality audits improves the contractual efficiency of earnings-based measures, and therefore, results in greater weights being placed on them when determining executive compensation.

A specialist auditor is one who has a competitive advantage in a particular industry compared to non-specialists in that industry (Casterella *et al.*, 2004). This advantage is derived through economies of scale in servicing a large number of clients in the industry, leading to an intimate knowledge of that industry. Defond and Zhang (2014), in a review of audit quality, state that industry specialization improves audit quality. Prior research shows that clients of specialist auditors have less earnings management compared to those of non-specialist auditors. Clients of industry specialists have lower discretionary accruals (Krishnan, 2003; Balsam *et al.*, 2003), better earnings response coefficients (Balsam *et al.*, 2003) and reduced levels of financial fraud (Carcello and Nagy, 2004). Dunn and Mayhew (2004) show that clients of specialist auditors have significantly better-quality financial reports compared to those of non-specialists. Fernando *et al.* (2010) show that clients of specialist auditors enjoy lower cost of capital compared to non-specialist auditors. Even in

the government sector, Deis and Giroux (1992) and O'Keefe *et al.* (1994) show better outcomes for clients of specialist auditors.

The impact of auditor industry specialization is recognized by both audit firm employees and their clients. Cahan *et al.* (2011) conducted extensive interviews with audit firm employees, ranging from staff to partners. They report that employees at all levels are aware of the importance of specialization, both from the perspective of improved technical knowledge leading to a better audit and a marketing perspective in being able to attract and retain clients. The employees also asserted that even their clients appreciate the industry specialization of their (the clients') auditors. One employee of an audit firm interviewed by Cahan *et al.* (2011) went as far as to say that clients may prefer industry expertise of the auditor to audit (or technical) expertise.

Accordingly, we conclude that auditor specialization leads to higher-quality audits and that higher-quality audits in turn lead to greater faith in financial numbers by compensation committees. Thus, using auditor specialization as the measure of audit quality, we state our first hypothesis as follows:

H1. In executive cash compensation, more weight will be placed on earnings-based measures as the auditor specialization improves.

Subramaniam and Thevaranjan (2007) use revenue-generating and cost-cutting efforts of CEOs to argue and provide empirical support that revenues will be weighted more than costs, or equivalently revenues will be weighted in addition to earnings, in determining CEO compensation. Given the care auditors exercise to verify sales revenues (Gramling *et al.*, 2010, p. 511), we predict that the impact of audit quality will be seen in the weight placed on sales revenues as well. This leads us to our second hypothesis:

H2. In executive cash compensation, more weight will be placed on sales as the auditor specialization improves.

In agency theory, the expected net compensation has to exceed the reservation wage, a condition required for an executive to join (or remain with) the firm. Increase in incentive compensation, therefore, will reduce the need for salary (or fixed) compensation. Moreover, the public outcry of the higher levels of CEO pay (Bebchuk and Fried, 2004; Willingham, 2016) will also cause salary levels to come down with greater auditor scrutiny. Accordingly, we state our third hypothesis as:

H3. In executive cash compensation, the salary levels will decrease as the auditor specialization improves.

Finally, we argue that the introduction of SOX has lessened the ability of auditor specialization (national-level market share of a particular industry captured by a particular auditor) to capture variations in audit quality among auditors for various reasons. First, SOX improved the quality of earnings overall (Cohen *et al.*, 2007; Carter *et al.*, 2009), leading to less need for monitoring. Second, SOX improved the overall quality of the audit, reducing the difference between the lowest-quality auditors and the highest-quality auditors. This fact has been substantiated by both academic research (Defond and Lennox, 2011) and the business press (Center for Audit Quality, 2008; Heller, 2015). Chambers and Payne (2008) show that, although the accruals' quality improved overall, the biggest improvement in accruals' reliability came from firms audited by non-specialist auditors. Third, there was consolidation in the audit industry, with the number of big auditors decreasing from eight to four. This again contributed to reducing the quality differences among auditors. Finally,

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SOX increased board and regulatory scrutiny on executive actions, as such, reducing the impact of audit quality on the agency conflict.

The combined effect of these changes in the business environment was to reduce the quality differentials in both earnings and audit and to reduce the variation in national-level auditor specialization measure, thus reducing its effectiveness in capturing variations in audit quality. This has been borne out by academic research which has found ambiguous results when using national-level auditor specialization measures (Cenker and Nagy, 2008; Cahan *et al.*, 2011) in the post-SOX period and also in the growing popularity of city- and partner-level specialization measures to proxy for audit industry specialization.

These observations lead us to conclude that national-level auditor industry specialization may not have influence on executive incentives in the post-SOX period, and we state our fourth and final hypothesis as follows:

H4. The impact of national-level auditor specialization on the weight on earnings, sales and the salary levels will be lower in the post-SOX than in the pre-SOX period.

4. Data and research design

4.1 Data

We use the Execucomp database to obtain executive compensation data, and the Compustat database to obtain the data for control variables. Execucomp database provides data for the top executives of the firm for a given year, and the data is available from 1992 onwards. The Execucomp contains information for 225,367 executive firm years of data. Once this data set is merged with the Compustat database and firm-years with missing data attributes are deleted, we end up with a total of 159,660 executive-firm-years, representing 33,161 firm-years and 2,710 distinct firms for the period 1992-2015.

4.2 Research design

4.2.1 Independent variables – measurement of audit quality. We use auditor industry specialization as our proxy for audit quality. Casterella *et al.* (2004, p. 123) describe auditor industry specialization as "A differentiation strategy whose purpose is to provide auditors with a sustainable competitive advantage over non-specialists". Crawswell *et al.* (1995) show that specialist auditors enjoy a fee premium. Specialist auditor clients have less earnings management (Krishnan, 2003; Balsam *et al.*, 2003) and significantly better AIMR (Association for Investment Management and Research) rankings (Dunn and Mayhew, 2004). Specialization is calculated as the percentage of total client sales revenue an auditor (i) audits in a particular industry (k) during a particular year (Krishnan, 2003). Auditor specialization can be measured at the national, individual office and partner levels. In this study, we rely on national-level auditor specialization. Hence, specialization is measured as:

$$Specialization = \frac{\sum_{j=1}^{J_{ik}} ClientSales_{ijk}}{\sum_{i=1}^{I_k} \sum_{i=1}^{J_{ik}} ClientSales_{ij}} \quad (1)$$

Where:

ClientSales – denotes client sales revenue

i – denotes audit firm

j – denotes client firms
k – denotes industry category
J_{ik} – denotes number of clients of the i^{th} auditor in the k^{th} industry
I_k – denotes number of audit firms in the k^{th} industry

We use "Specialization", a continuous variable, as described above in Model (1), as our proxy for audit quality.

4.2.2 Dependent variable – compensation. We obtain executive compensation data from Execucomp. Our hypotheses assume that cash compensation is used to reward the management for past earnings. We obtain cash compensation, which includes the executives' salary and bonus, using the variable "Total_Curr" from Execucomp database, which is the total of salary and bonus for the executive. To normalize the variation in cash compensation variable, we use the log value of cash compensation.

4.2.3 Control variables – economic determinants of executive compensation. Tosi *et al.* (2000) find that firm size accounts for more than 40 per cent of the variance in compensation. They find that some of the proxies used for size are market value of equity, sales, total assets and employees. We use total assets to proxy for size, and use log transformation to avoid non-linearity in data.

Tosi *et al.* (2000) identify performance measures as contributing to around 5 per cent of the variance in compensation. Standard agency theory also predicts that firm performance will be a significant factor in the compensation of the CEO, and this has been empirically confirmed by Murphy (1999). Tosi *et al.* (2000) and Core *et al.* (1999) identify returns on assets (ROA) and stock returns (RET) as proxies for performance. Hence, we include ROA and RET to proxy for firm performance.

In addition, we also use sales revenue as a proxy for performance. While sales normally proxy for size, executives are also compensated for increasing revenue. This is especially true for sales executives. Validating sales revenue is a significant component of an audit. Therefore, higher-quality auditors will increase the reliability of the reported revenue, making compensation committees more likely to use such revenue in determining executive compensation. Because our analyses involve all executives, we use sales revenue as another proxy for performance.

We also control for industry and year, as these factors also affect CEO compensation.

4.2.4 Regression analysis. To test if audit quality impacts executive compensation, we run the following regression:

$$\log \text{Cash} = a_0 + a_1\text{Size} + a_2\text{SALE} + a_3\text{ROA} + a_4\text{RET} + a_5\text{SPX} + a_6\text{SPXintROA} + a_7\text{SPXintSALE} + \text{Year and Industry dummies} + e \quad (2)$$

where logCash is the log of cash compensation, SIZE is the log of total assets (Compustat "AT"), SALE is the log value of net sales (Compustat "SALE"), ROA is the return on assets computed as net income (Compustat "IB") scaled by average total assets (derived from Compustat "AT") and RET is the total returns to the investors computed as the sum of market returns and dividend returns. SPX is a continuous variable computed as the client sales revenue of a particular auditor in a particular industry scaled by the total sales revenue of all firms in that industry for a given year.

The main independent variables we use in this study are the audit quality variable SPX and the interaction of ROA and SALE with SPX. SPX will show the impact of audit quality on the level of executive compensation and will test *H3*. SPXintROA will test *H1* by demonstrating the impact of audit quality in determining the weight placed on ROA in determining executive compensation. Similarly, SPXintSALE will test *H2* by demonstrating

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the impact of audit quality on the weight placed on sales revenue in determining executive compensation. As per our hypotheses, we expect a_5 (the coefficient of SPX) to be negative and significant while a_6 (the coefficient of SPXintROA) and a_7 (the coefficient of SPXintSALE) to be positive and significant.

To evaluate *H4*, we run the above model on three different datasets based on time periods. First, we run the model for our entire data set spanning the period 1992-2015. Next, we separate the date into two sub-samples based on the SOX implementation year of 2002. The rationale for this chronological bifurcation is that SOX had a significant effect on the public audit landscape. First, audit quality overall improved after SOX (Defond and Lennox, 2011). Second, there was a substantial consolidation in the audit industry, with the total number of big audit firms dropping from eight in the late-1980s to four by 2002. Because of the post-SOX improvement in the overall audit quality and the fact that the four remaining auditors will have clients in every industry, auditor specialization may not be an appropriate proxy for audit quality in the post-SOX period.

5. Results and analysis

5.1 Descriptive statistics

Table I contains the descriptive statistics. The average (median) cash compensation paid to an executive is $617,400 ($451,260) and the total compensation is $2,226,380 ($1,123,890). The average sales revenue and total assets for a firm are $5,463,000m and $6,687,820m, respectively. The average ROA is 9.93 per cent and returns are 19.82 per cent. The average SPX for the overall sample is 25.04 per cent.

Table II shows the Spearman correlation table for the variables we use in our regression. Our variable of interest, SPX, is significantly and positively correlated with compensation. However, we attribute it to the mechanical effect of clients of specialist auditors being generally larger, and larger firms paying more to their executives. SPX is also positively related to "Size" and "logSales". Another point to note is that Size and logSales are strongly correlated with each other, raising the possibility of multi-collinearity in the regression analyses.

Variable	Mean	Median	SD	25th Pctl	75th Pctl	*N*
Cash Comp	617.44	451.26	567.08	302.97	725.00	159,660
Total Comp	2,226.38	1,123.89	4,542.30	571.33	2,338.82	159,660
SALE	5,463.00	1,349.94	17,452.69	500.38	4,017.34	159,660
TA	6,687.82	1,424.16	24,211.47	501.59	4,603.91	159,660
MVE	7,146.11	1,435.19	23,885.07	527.99	4,510.51	159,660
ROA	0.0993	0.0952	0.1050	0.0559	0.1464	159,660
RET	0.1982	0.1127	0.5857	−0.1299	0.3867	159,660
SPX	0.2504	0.2393	0.1379	0.1434	0.3233	159,660

Notes: *Variable Descriptions*: "Cash Comp" ($ '000) refers to total cash compensation obtained from the "Total_Curr" variable on the "Execucomp" database. "Total Comp" ($ '000) refers to total equity compensation obtained from the "TDC1" variable on the "Execucomp" database. "SALE" refers to Net Sales revenue obtained from the "SALE" variable of the Compustat database. "TA" ($ 'millions) refers to total sssets of the firm obtained from the "AT" variable of the Compustat database. "MVE" is the market value of equity, computed as the total number of shares outstanding (Compustat CSHO) × Stock price at fiscal year end (Compustat PRCC_F). "ROA" is the return on assets computed as "income before extraordinary items" (Compustat IB)/"average total assets". "RET" is the stock returns for the fiscal year computed as $\{[MVE_{(end\ of\ year)} - MVE_{(beginning\ of\ year)}]/\ MVE_{(beginning\ of\ year)}\}$ + Dividends for the year (Compustat DVC). "SPX" is the auditor specialization computed as the client sales revenue of a particular auditor in a particular industry scaled by the total sales revenue of all firms in that industry for a given year

Table I.
Descriptive statistics

	Spearman correlation coefficients, $N = 159{,}660$					
	logCash	Size	logSales	ROA	RET	SPX
logCash	1.0000	0.5564	0.5690	0.1310	0.0790	0.1205
		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Size	0.5564	1.0000	0.9114	−0.0251	−0.0024	0.2053
	<0.0001		<0.0001	<0.0001	0.3456	<0.0001
LogSales	0.5690	0.9114	1.0000	0.0908	−0.0094	0.1832
	<0.0001	<0.0001		<0.0001	0.0002	<0.0001
ROA	0.1310	−0.0251	0.0908	1.0000	0.1900	−0.0235
	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001
RET	0.0790	−0.0024	−0.0094	0.1900	1.0000	−0.0192
	<0.0001	0.3456	0.0002	<0.0001		<0.0001
SPX	0.1205	0.2053	0.1832	−0.0235	−0.0192	1.0000
	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	

Notes: *Variable Descriptions*: "logCash" refers to log of cash compensation (see Table I) and "Size" refers to log of total assets (see Table I). logSales refer to the log of total sales revenue ("SALE"). ROA refers to the return on assets, while RET is the stock returns for the year. "SPX" is the auditor specialization variable

Table II.
Correlation coefficients

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5.2 Regression results

Table III presents the results of Model (2). All regression results displayed have been corrected for potential auto-correlation and heteroskedasticity effects by using the "clustering" method recommended by Petersen (2009). Panel A shows results for the entire

	Panel A Overall data set from 1992-2015			Panel B Pre-SOX data set [1992-2002]			Panel C Post-SOX data set [2004-2015]		
Parameter	Estimate	*t* Value	Pr > *t*	Estimate	*t* Value	Pr > *t*	Estimate	*t* Value	Pr > *t*
Intercept	4.2213	91.46	<0.0001	4.0888	78.8	<0.0001	4.5964	65.72	<0.0001
Size	0.1840	19.56	<0.0001	0.2049	16.83	<0.0001	0.1769	13.87	<0.0001
Sales	0.0728	6.65	<0.0001	0.0714	5.37	<0.0001	0.0400	2.65	0.0082
ROA	0.3738	3.55	0.0004	0.3860	2.81	0.005	0.1138	1.08	0.2786
RET	0.0694	16.96	<0.0001	0.0863	15.73	<0.0001	0.0410	6.59	<0.0001
SPX	−0.1934	−1.24	0.2142	−0.8140	−4.79	<0.0001	−0.1080	−0.49	0.62
SPXintROA	0.4107	1.14	0.256	1.0925	2.13	0.0332	0.5518	1.49	0.1368
SPXintSALES	0.0180	0.84	0.4002	0.0849	3.56	0.0004	0.0148	0.51	0.6073
N			159,660			75,360			76,740
R2			0.3995			0.4368			0.3547

Notes:

$$\log \text{Cash} = a_0 + a_1\text{Size} + a_2\text{SALE} + a_3\text{ROA} + a_4\text{RET} + a_5\text{SPX} + a_6\text{SPXintROA} + a_7\text{SPXintSALE} + e \quad (2)$$

Variable descriptions: The dependent variable "logCash" refers to log of cash compensation (Table I) and "Size" refers to log of total assets (Table I). logSales refer to the log of total sales revenue ("SALE"). ROA refers to the return on assets, while RET is the stock returns for the year. "SPX" is the auditor specialization variable. "SPXintROA" is the "SPX" variable interacted with "ROA", while "SPXintSALE" is the "SPX" variable interacted with "SALE"

Table III.
Impact of audit quality on incentive cash compensation

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sample where the variables of interest, SPX, SPXintROA and SPXintSALE have the expected signs (−ve, +ve and +ve), but not the statistical significance expected by our hypotheses. The control variables have the expected signs and significances, and the *R*-squared value of 39.95 per cent is comparable to extant literature (Core *et al.*, 1999).

Panel B shows the results for the period prior to SOX of 2002. The results show that in the pre-SOX period, SPX is negative and significant, while SPXintROA and SPXintSALE are positive and significant. These results indicate that first, as auditor specialization increases, the level of compensation declines. Second, they indicate that as auditor specialization increases, the weight placed on ROA in determining cash compensation also increases. Third, and finally, the results also show that as auditor specialization increases, the weight placed on sales revenue in determining compensation also improves. The results show the relevance of auditor specialization in determining different components of executive compensation. Similar to Panel A, the control variables in Panel B has the relevant signs and significances, and the *R*-squared of 43.68 per cent is comparable to prior research.

Finally, Panel C shows the results for regression Model (2), for the post-SOX period. As in Panel A, the variables of interest (SPX, SPXintROA and SPXintSALE) have the expected signs, but lack significance. Hence, it is evident that the lack of significance in the overall sample is driven by the post-SOX period. This supports the contention in *H4* that national-level auditor specialization is not as important in this period. The control variables have the expected signs and significance except for ROA.

Un-tabulated results show that variance inflation factors (VIFs) for all three sets of regressions contain values for some variables of interest that indicate the presence of multicollinearity. Because multi-collinearity biases against results, we do not expect multi-collinearity to be an issue in Panel B. However, there is a possibility that the lack of results we observe in Panels A and C may be potentially caused by the presence of multi-collinearity. To investigate this possibility, we run Model (2) by selectively omitting some of the variables that may cause multi-collinearity. For example, based on VIFs, the variables most likely to cause multi-collinearity are "SALE" and Size. Therefore, we first eliminate "SALE" and SPXintSALE from Model (2) and evaluate the SPXintROA. Next, we re-introduce "SALE" and SPXintSALE while eliminating "Size" and SPXintROA. Untabulated results from these analyses show that results are not qualitatively different from those shown in the three panels.

There is potential for omitted variables to distort the results of our regression model. To overcome this problem, we also run the regression with changes in compensation as the dependent variable. We replace the dependent variable in Model (2) with the change in cash compensation [i.e. cash compensation of year (t) less the cash compensation of year (t − 1)]. Untabulated results show that the findings of this alternate model specification are qualitatively similar to those displayed in Table III, mitigating concerns of omitted variables.

6. Conclusion

We use agency theoretic arguments to predict that as audit quality increases, the ability of managers to manipulate performance measures such as earnings and revenues becomes costlier. Hence, the informativeness of earnings and revenues increases with respect to the productive effort of the managers. The firm is therefore able to place a higher weight on these accounting measures of performance in determining the managers' incentive compensation.

We investigate this prediction empirically. We use auditor specialization to proxy for audit quality and predict that, for clients of specialist auditors, there will be more weight placed on accounting performance measures in determining the cash component of CEO compensation. Using data from the Execucomp and Compustat databases, we show that as

auditor quality, proxied by specialization, increases, ROA and sales revenue will become more important in determining executive cash compensation. Furthermore, as auditor specialization increases, the level of cash compensation paid to executives will decrease, denoting a shift from base pay to incentive pay.

Our final set of results shows that the importance of auditor specialization has abated in the post-SOX period. This result can have two explanations. One possibility is that post-SOX, quality differences among auditors, at least at the national level, have diminished to an extent that cross-sectional differences in audit quality do not affect accounting-related research variables to the extent they did in the past. The second possibility is that auditor quality differentials still exist, but that specialization is no longer a valid proxy to test national-level audit quality differences. In fact, audit quality research appears to have moved away from national-level quality differences to office- and partner-level variations (Ferguson *et al.*, 2003; Reichelt and Wang, 2010; Fung *et al.*, 2012). This move away from national-level auditor industry specialization research supports the lack of results we observe for the national-level auditor industry specialization measure in the post-SOX period. The precise explanation as to whether this is due to diminished variation in audit quality at the national level or the inability of the auditor industry specialization to capture such differences, if they still exist, is a matter for future research.

The contribution of this study to accounting literature is threefold. First, to the best of our knowledge, this is the first paper that shows the effects of audit quality on the determinants of executive compensation. We find empirical evidence that audit quality is beneficial in mitigating the agency problem in firms by making executive compensation more responsive to accounting-based performance. Second, this study also investigates the impact of audit quality on sales revenues of a firm. While research on the impact of audit quality on earnings is abundant, research on audit quality impact on the use of sales revenue as a measure of performance is scarce. Finally, we point to how national-level audit specialization has become less relevant in the post-SOX period, and discuss potential explanations for this observation. This paper contributes to our understanding of the changing effects of auditor specialization on the audit clients, and also highlights the differences in the pre- and post-SOX periods.

Our results should be interpreted subject to the following two caveats. First, we use cash compensation in our study. However, cash compensation has been dwarfed by equity compensation in recent times (Core *et al.*, 2003; Bushman and Smith, 2001). Research also suggests that the major part of a CEO's incentives are equity based (Core *et al.*, 2003); hence, the relevance of cash incentives may not be as important. The second caveat is the measure of industry specialization we use. Although national-level industry specialization has been widely accepted as a proxy for auditor industry expertise, and auditor quality, research has pointed out some issues with this measure (Audousset-Coulier *et al.*, 2016 for a detailed criticism of different proxies). Defond and Zhang (2014) assert that auditor industry specialization is prone to significant measurement error, that there is no consensus on the measurement of specialization and that specialization fails to "capture subtle variations in audit quality" (p. 289). Cahan *et al.* (2011) also suggest that specialization based on market share maybe an inverse proxy for audit quality, with the market leader maintaining its position by competing on price, and thus lowering the quality of the audit. Cahan *et al.* (2011) further states that in addition to industry specialization, auditors may also specialize by topical areas such as valuations, acquisitions pensions, etc. These caveats lead to interesting suggestions for future research. One avenue would be to investigate the impact of audit quality on equity compensation. A second avenue would be to consider different proxies for

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auditor specialization (i.e. city level, partner level, topical, etc.) to investigate their impact on incentive compensation.

Notes

1. DeAngelo (1981) defines audit quality as "the ability to detect and the willingness to report breaches in the clients accounting system". Hence, audit quality becomes a function of the technical expertise of the auditor, which will enable him to detect "breaches" and the auditors political power *vis-a-vis* the managers of the firm that will enable him to report the "breaches" to the shareholders.
2. Mullaney (2015) and Willingham E. (2016).
3. Salary and bonus are the cash components of compensation.
4. The managers are putting the excess earnings away in the "cookie jar" to be used in the lean years. Healy interprets this result as "strong association between accruals (*Healy's measure of earnings management*) and managers' income-reporting incentives under their bonus plan" (p. 106).

References

Audousset-Coulier, S., Jeny, A. and Jiang, L. (2016), "The validity of auditor industry specialization measures", *Auditing: A Journal of Practice & Theory*, Vol. 35 No. 1, pp. 139-161.

Balsam, S., Krishnan, J. and Yang, J. (2003), "Auditor industry specialization and earnings quality", *Auditing: A Journal of Practice & Theory*, Vol. 22, pp. 71-97.

Bebchuk, L. and Fried, J. (2004), "Pay without Performance: The Unfulfilled Promise of Executive Compensation", Harvard University Press, Cambridge and London.

Becker, C., Defond, M., Jiamblvo, J. and Subramanyam, K. (1998), "The effect of audit quality on earnings management", *Contemporary Accounting Research*, Vol. 15, pp. 1-24.

Bergstresser, D. and Philippon, T. (2006), "CEO incentives and earnings management", *Journal of Financial Economics*, Vol. 80, pp. 511-529.

Bushman, R.M. and Smith, A.J. (2001), "Financial accounting information and corporate governance", *Journal of Accounting and Economics*, Vol. 32, pp. 237-333.

Cahan, S.F., Jeter, D.C. and Naiker, V. (2011), "Are all industry specialist auditors the same?", *Auditing: A Journal of Practice & Theory*, Vol. 30, pp. 191-222.

Carcello, J. and Nagy, A. (2004), "Client size, auditor specialization and fraudulent financial reporting", *Managerial Auditing Journal*, Vol. 19 No. 5, pp. 651-668.

Carter, M.E., Lynch, L.J. and Zechman, S.L.C. (2009), "Changes in bonus contracts in the post-Sarbanes–Oxley era", *Review of Accounting Studies*, Vol. 14, pp. 480-506.

Casterella, J., Francis, J., Lewis, B. and Walker, P. (2004), "Auditor industry specialization, client bargaining power, and audit pricing", *Auditing: A Journal of Practice and Theory*, Vol. 23, pp. 123-140.

Cenker, W. and Nagy, A. (2008), "Auditor resignations and auditor industry specialization", *Accounting Horizons*, Vol. 22, pp. 279-295.

Center for Audit Quality (2008), "Post-SOX audit quality has improved, say nation's audit committee members", 18 March, available at: www.thecaq.org/post-sox-audit-quality-has-improved-say-nation%E2%80%99s-audit-committee-members (accessed 12 January 2016).

Chambers, D.J. and Payne, J.L. (2008), "Audit quality and accrual reliability: evidence from the pre- and post-Sarbanes-Oxley periods", available at: https://ssrn.com/abstract=1124464 or http://dx.doi.org/10.2139/ssrn.1124464

Cheng, Q. and Warfield, T.D. (2005), "Equity incentives and earnings management", *The Accounting Review*, Vol. 80, pp. 441-476.

Cohen, D., Dey, A. and Lys, T. (2007), "Real and accrual based earnings management in the pre and post Sarbanes Oxley periods", *The Accounting Review*, Vol. 83 No. 3, pp. 757-787.

Downloaded by 91.99.14.147 At 06:03 17 October 2017 (PT)

Conyon, J. (2006), "Executive compensation and incentives", *The Academy of Management Perspectives*, Vol. 20 No. 1, pp. 25-44.

Copeland, T., Weston, J. and Shastri, K. (2005), *Financial Theory and Corporate Policy*, 4th ed., Pearson Addison Wesley.

Core, J., Guay, W. and Larcker, D. (2003), "Executive equity compensation and incentives: a survey", *Economic Policy Review*, Vol. 9 No. 1.

Core, J., Holthausen, R. and Larcker, D. (1999), "Corporate governance, chief executive officer compensation, and firm performance", *Journal of Financial Economics*, Vol. 51 No. 3, pp. 371-406.

Crawswell, A., Francis, J. and Taylor, S. (1995), "Auditor brand name reputation and industry specialization", *Journal of Accounting and Economics*, Vol. 20, pp. 297-322.

DeAngelo, L. (1981), "Auditor size and auditor quality", *Journal of Accounting and Economics*, Vol. 3, pp. 183-199.

Dechow, P., Sloan, R. and Sweeney, A. (1995), "'Detecting earnings management", *The Accounting Review*, Vol. 70, pp. 193-225.

DeFond, M. and Zhang, J. (2014), "A review of archival auditing research", *Journal of Accounting and Economics*, Vol. 58, pp. 275-236.

DeFond, M.L. and Lennox, C.S. (2011), "The effect of SOX on small auditor exits and audit quality", *Journal of Accounting and Economics*, Vol. 52 No. 2011, pp. 21-40.

Deis, D.R.J. and Giroux, G.A. (1992), "Determinants of audit quality in the public sector", *The Accounting Review*, Vol. 67 No. 3, pp. 462-479.

Dunn, K. and Mayhew, B.W. (2004), "Audit firm industry specialization and client disclosure quality", *Review of Accounting Studies*, Vol. 9, pp. 35-58.

Efendi, J., Srivastav, A. and Swanson, E. (2007), "Why do corporate managers misstate financial statements? The role of option compensation, corporate governance and other factors", *Journal of Financial Economics*, Vol. 85, pp. 667-708.

Ferguson, A., Francis, J.R. and Stokes, D.J. (2003), "The effects of firm-wide and office-level industry expertise on audit pricing", *The Accounting Review*, Vol. 78 No. 2, pp. 429-448.

Fernando, G., Abdel-Meguid, A. and Elder, R. (2010), "Audit quality attributes, client size and cost of equity capital", *Review of Accounting and Finance*, Vol. 9 No. 4, pp. 363-381.

Fung, Y.K., Gul, F.A. and Krishnan, J. (2012), "City-level auditor industry specialization, economies of scale, and audit pricing", *The Accounting Review*, Vol. 87 No. 4, pp. 1281-1307.

Gaver, J., Gaver, K. and Austin, J. (1995), "Additional evidence on bonus plans and income management", *Journal of Accounting and Economics*, Vol. 18, pp. 3-28.

Gramling, A.A., Rittenberg, L.E. and Johnstone, K.M. (2010), *Auditing*, South-Western Cengage Learning.

Hanlon, M., Rajgopal, S. and Shevlin, T. (2003), "Are executive stock options associated with future earnings?", *Journal of Accounting and Economics*, Vol. 36 Nos 1/3, pp. 3-43.

Healy, P. (1985), "The effect of bonus schemes on accounting decisions", *Journal of Accounting and Economics*, Vol. 7, pp. 85-107.

Heller, M. (2015), "SEC chair: audit quality improving since SOX", 10 December, available at: http://ww2.cfo.com/auditing/2015/12/sec-chair-audit-quality-improving-since-sox/ (accessed 12 January 2016).

Holthausen, R., Larcker, D. and Sloan, R. (1995), "Annual bonus schemes and the manipulation of earnings", *Journal of Accounting and Economics*, Vol. 19, pp. 29-74.

Jensen, M. and Meckling, W. (1976), "Theory of the firm: managerial behavior, agency costs, and ownership structure", *Journal of Financial Economics*, Vol. 3 No. 4, pp. 305-360.

Jensen, M. and Murphy, K. (1990), "Performance pay and top-management incentives", *Journal of Political Economy*, Vol. 98 No. 2, pp. 225-264.

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Knechel, W., Krishnan, G., Pevzner, M., Shefchik, L. and Velury, U. (2013), "Audit quality: insights from the academic literature", *Auditing: A Journal of Practice & Theory*, Vol. 32, pp. 385-421.

Krishnan, G. (2003), "Does Big 6 auditor industry expertise constrain earnings management?", *Accounting Horizons*, Vol. 17, pp. 1-16.

Lambert, R. (1993), "The use of accounting and security price measures of performance in managerial compensation contracts: a discussion", *Journal of Accounting and Economics*, Vol. 16 Nos 1/3, pp. 101-123.

Lambert, R. and Larcker, D. (1987), "An analysis of the use of accounting and market measures of performance in executive compensation contracts", *Journal of Accounting Research*, Vol. 25, pp. 95-125.

Lewellen, W., Loderer, C. and Martin, K. (1987), "Executive compensation and executive incentive problems: an empirical analysis", *Journal of Accounting and Economics*, Vol. 9, pp. 287-310.

Mullaney, T. (2015), "Why corporate pay is so high and going higher", 18 May, available at: www.cnbc.com/2015/05/18/why-corporate-ceo-pay-is-so-high-and-going-higher.html

Murphy, K. (1999), "Executive compensation", in Ashenfelter, O. and Card, D. (Eds), *Handbook of Labor Economics*, North Holland-New York, Vol. 3.

O'Keefe, T.B., King, R.D. and Gaver, K.M. (1994), "Audit fees, industry specialization, and compliance with GAAS reporting standards", *Auditing: A Journal of Practice & Theory*, Vol. 13 No. 2, pp. 41-55.

Petersen, M.A. (2009), "Estimating standard errors in finance panel data sets: comparing approaches", *Review of Financial Studies*, Vol. 22, pp. 435-480.

Rajgopal, S. and Shevlin, T. (2002), "Empirical evidence on the relation between stock option compensation and risk taking", *Journal of Accounting and Economics*, Vol. 2 No. 33, pp. 145-171.

Reichelt, K.J. and Wang, D. (2010), "National and office-specific measures of auditor industry expertise and effects on audit quality", *Journal of Accounting Research*, Vol. 48 No. 3, pp. 647-686.

Schipper, K. and Vincent, L. (2003), "Earnings quality", *Accounting Horizons*, Vol. 17, pp. 97-110.

Sloan, R.G. (1993), "Accounting earnings and top executive compensation", *Journal of Accounting and Economics*, Vol. 16 No. 1, pp. 55-100.

Smith, C. and Watts, R. (1982), "Incentive and tax effects of executive compensation plans", *Australian Journal of Management*, Vol. 7, pp. 139-157.

Smith, C. and Watts, R. (1992), "The investment opportunity set and corporate financing, dividend, and compensation policies", *Journal of Financial Economics*, Vol. 32 No. 3, pp. 263-292.

Subramaniam, C. and Thevaranjan, A. (2007), "The role of revenues and costs in CEO compensation", in Neelan, M.H. (Ed.), *Focus in Finance and Accounting Research*, Nova Publishers, Book Chapter, pp. 1-21.

Tosi, H., Werner, S., Katz, J. and Gomez-Mejia, L. (2000), "How much does performance matter? A meta-analysis of CEO pay studies", *Journal of Management*, Vol. 26, pp. 301-339.

Wallace, W. (1980), *The Economic Role of the Audit in Free and Regulated Markets*, Touche Ross Foundation.

Willingham, E. (2016), "CEO of EpiPen Maker Mylan Sees 671 per cent compensation increase in 8 YEARS", 23 August, available at: www.forbes.com/sites/emilywillingham/2016/08/23/ceo-of-mylan-pharmaceuticals-sees-671-salary-increase-in-8-years/#2a6925614b23

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