

Non-Audit Services and Audit Quality: Investors' Concerns Post-Enron

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ABSTRACT

This study examines investors' perceptions about audit quality in the post-Enron years 2003-2006 in an environment characterized by low-litigation risk (Norway). Overall, we find that annual stock market returns are less responsive to reported earnings when auditors' provision of non-audit services (NAS) to the reporting firms is relatively high. The negative effect on the earnings response coefficients is moderated if the audit is by a Big 4 firm. The adverse investor perceptions are driven by observations early in the period, especially 2003, a year with escalating scandals and severe criticism of the audit profession. Our findings are consistent with the interpretation that regulatory initiatives and perhaps a refocus in the audit firms in the wake of the Enron scandal were instrumental in easing investors' concerns of provision of NAS to audit clients.

Keywords: Non-audit services; Audit quality; Investors' perceptions; Earnings response coefficients.

Data Availability: Data are publicly available from the listed sources.

I. INTRODUCTION

Commitment to objectivity is the cornerstone of the accounting profession. The professional accountant should not allow bias, conflicts of interest, or undue influence of others to override professional judgments (IFAC 2005). Auditor independence from the client demonstrates objectivity to the public. Recent financial scandals and audit failures in Europe and the U.S. have reinforced concerns about auditors' independence and the risk of the auditor compromising objectivity. Independence is arguably one of the most complicated and controversial aspects of auditor professionalism. Regulators and the profession recognize the relevance both of independence in fact and independence in appearance.¹ One of the most debated threats to auditors' independence arises from economic bonds between the auditor and the firm being audited. At the heart of this debate has been the potentially adverse effect on the audit, actual or perceived, of the economic bonds stemming from the joint provision of audit and non-audit services (NAS). Concern about impairment of independence has led regulators to restrict auditors from providing NAS. The appropriateness of auditors providing NAS to audit clients continues to be controversial. Investors and those in charge of clients' corporate governance may also be concerned about NAS provided by the auditor.

Research has long sought to establish how economic bonds between the auditor and client arising from NAS provision affect the objectivity of auditors, actual as well as perceived. Although exceptions exist (Frankel et al. 2002; Gul et al. 2007), most of the considerable body of studies of the direct outcome of the audit process are unable to establish that the joint provision of audit and NAS jeopardizes auditors' actual objectivity (DeFond et al. 2002; Ashbaugh et al. 2003; Chung and Kallapur 2003; Larcker and Richardson 2004; Kinney et al. 2004; Reynolds et

¹ Independence in fact relates to the auditor's actual behavior, i.e., if the auditor actually behaves without being affected by interests that may impair objectivity. Independence in appearance relates to third parties perception, i.e., if third parties such as investors perceive that auditor interests impair objectivity.

al. 2004; Antle et al. 2006; Huang et al. 2007). In contrast, the more limited body of investor perception studies leans more towards the conclusion that the provision of NAS to audit clients is adversely perceived (Krishnan et al. 2005; Gul et al. 2006; Francis and Ke 2006).

This study investigates how investors on the Oslo Stock Exchange in Norway perceive the joint provision of audit and NAS post-Enron, as reflected in their response to reported earnings. The Enron debacle initiated massive attention and regulatory initiatives on the purchase of NAS from the incumbent auditor, first in the U.S and then internationally in countries like Norway. This may have affected whether audit quality is compromised by NAS, including whether NAS adversely affect the appearance of auditor independence. In the post-Enron period, the level of investors' concerns about purchases of NAS is an open question.

Litigation is considered one of the most effective disciplining mechanisms on auditors. Norway compared to the U.S. is classified as a low litigation environment (Hope and Langli 2008).² This may reduce auditors' incentives to resist client-induced biases in the financial reporting, and *ceteris paribus* increase investors' concerns about NAS provided by the auditor. Like the U.S., Norway is regarded as a country with strong investor protection (La Porta et al. 1998). This may induce less earnings management, and earnings announcements may be more informative than in countries with lower investor protection (Leuz et al. 2003; DeFond et al. 2007). The strong investor protection environment increases the comparability of our study with prior studies. The few prior studies of jurisdictions representing environments with less litigation than the U.S., but with strong investor protection, focus on actual auditor objectivity and provide inconclusive evidence on the effect of joint provision of audit and NAS on auditors' independence (Ferguson et al. 2004; Ruddock et al. 2006; Antle et al. 2006).

² Niemi (2002) describes the liability regime for auditors in Finland which is similar to that in Norway.

The purpose of this study is to examine investors' concerns of auditors' provision of NAS to audit clients *after Enron's demise* in an environment characterized by *low litigation risk*. The Enron debacle was followed by a series of accounting scandals and massive regulatory initiatives to restore confidence in the auditing function. Thus, if the regulatory initiatives aimed at controlling adverse effects on audit quality caused by NAS are considered ineffective, prior research indicates that investors would continue be concerned about the joint provision of audit services and NAS post-Enron, especially in a low-litigation environment. Evidence of absence of investor concerns or relieve of these would in this low litigation setting provide relatively strong indications that the post-Enron regulatory initiatives and perhaps a refocus in the audit firms on audit quality were instrumental in comforting investors.

The current study uses data from Norway covering the period 2003-2006 and finds that high NAS is associated with reduced earnings response coefficients. This association is moderated when the auditor is from a Big 4 firm. We also find that the year closest to the Enron debacle (i.e., 2003) is the fundamental driver of our main result, indicating that regulatory initiatives in the wake of the Enron scandal and perhaps a refocus in the audit firms on audit quality and their service portfolio have relieved investors from concerns of auditors providing NAS. Our study is unique in providing evidence on the effect of purchase of NAS on independence in appearance in a post-Enron and low litigation environment.

The remainder of the paper is organized as follows. Section II discusses the background of the study and develops the hypotheses. The research design is outlined and discussed in Section III. The next section presents the data and descriptive statistics. Section V includes the analysis and discussion of findings. Conclusions and some future avenues for research are presented in Section VI.

II. BACKGROUND AND HYPOTHESES

Research argues that the economic bonds between the auditor and the client established by the provision of NAS to the incumbent auditors may dilute auditor objectivity in the audit (DeAngelo 1981a; Simunic 1984; Beck et al. 1988; Arruñada 1999). Revenues from NAS make it less likely that the auditor will object to biased management accounting choices. For a long time regulators have articulated this concern. The wave of recent financial scandals, starting with Enron in the fall of 2001, accentuated regulators' anxiety over the provisions of NAS, and additional restrictions on the scope of NAS to audit clients have been imposed. Research also posits that auditors have incentives to resist such dilution of objectivity including auditor's concerns for reputation and lawsuits. Further, joint provision of audit and NAS, especially knowledge spillovers between services, has potential to improve the auditor's ability to detect biases in the financial reporting (Kinney et al. 2004; Huang et al. 2007). Thus, it is ex ante an open question if the joint provision of audit and NAS impairs auditor objectivity.

Most empirical research has focused on the association between NAS and the factual impairment of auditor independence, using proxies for auditors' objectivity such as earnings management (e.g., abnormal accruals) and auditor reporting (e.g., going concern reporting). The considerable body of empirical evidence shows weak or no effect of NAS on actual auditor objectivity. This evidence is extensively discussed elsewhere in the literature (Francis 2006; Lim and Tan 2008).³ Of specific relevance for our study, Hope and Langli (2008) investigate the

³ The vast majority of studies are based on U.S. data, but some studies have used data from Australian and the U.K. Like some earlier Australian studies, Craswell et al. (2002) find that the level of auditor fee dependence do not affect auditor propensity to issue unqualified opinions. In a more recent study on Australian data Ruddock et al. (2006) find no evidence that NAS have an adverse effect on audit quality as reflected through earnings conservatism. In the U.K., Lennox (1999) observes a positive but insignificant association between audit qualifications and NAS. He interprets this as being consistent with NAS impairment effect on auditor independence being more than offset by an increase in auditor detection of client problems as a result of NAS. Gore et al. (2001) find some evidence that NAS impair independence and that Big 5 auditors constrain earnings management more effectively than non-Big 5 auditors when the level of NAS increases. Ferguson et al. (2004) find, with one exception, that three measures of

association between auditor fees, including NAS fees, and the auditors' propensity to issue a modified going concern report using a large sample of private Norwegian firms for the period 1997-2002. They find no evidence that auditors compromise their objectivity through fee dependence. In a supplementary analysis they also report that their result sustains using a sample of public companies listed on the Oslo Stock Exchange (OSE) for the period 1997-2005.⁴

The provision of NAS may also affect financial statements users' opinion or perceptions of auditor independence. Some recent research examines the NAS perception issue by studying the stock market's reaction to the disclosure of NAS fees. If investors believe that provision of NAS reduces the probability of credible financial reporting, the value relevance of reported earnings should decrease, as measured by, e.g., earnings response coefficients. The empirical research findings tend to support that NAS can adversely affect the appearance of auditor independence (Francis 2006).

Frankel et al. (2002) report a negative association between non-audit fees and abnormal returns in share prices. Ashbaugh et al. (2003) are critical of Frankel et al.'s research design, and their replication finds no evidence of market reactions to the magnitude of non-audit fees.⁵ Krishnan et al. (2005) investigate the association between fee-based measures of NAS (non-audit fee ratio, level of non-audit fees and unexpected non-audit fees) and earnings response coefficients. Their results indicate negative investor perceptions of NAS, consistent with investors perceiving large purchases of NAS as impairing auditor independence. Such negative perceptions do not, however, extend to total fees. Francis and Ke (2006) investigate whether

earnings management are positively associated with purchased NAS. In contrast, Antle et al. (2006) using U.K. data as well as U.S. data do not find support for a positive association between NAS and earnings management. To the contrary, they find that non-audit fees decrease accruals, which the authors attribute to the productive effects of NAS. Their evidence also indicates that audit fees increase abnormal accruals, consistent with close ties between auditors and their clients causing bias in the financial reporting, possibly unconscious.

⁴ In this additional analysis Hope and Langli (2008) use abnormal total fee as the independent variable for explaining going concern reporting.

⁵ See also Kinney and Libby (2002) for a discussion of Frankel et al. (2002).

mandated disclosure of fees paid to auditors negatively affects investors' perceptions of auditor independence. They find that in the year after the fee is disclosed, the earnings response coefficients on quarterly earnings surprises are significantly lower for firms whose auditor receive high NAS relative to firms with low NAS, but find no such effect in the year before disclosure. Lim and Tan (2008) also find that the market reactions to earnings surprises are significantly lower for firms that purchase NAS, but this is moderated if the auditor is an industry specialist. All these investor perception studies use samples of U.S data from prior to 2002.⁶

Our paper investigates whether investors' perception of audit quality is affected by the provision of NAS by the incumbent auditor. The above reasoning and evidence from prior research on investors' perceptions lead us to expect that the relationship between stock returns and price-deflated earnings is negatively related to the extent of NAS provided by the firm's auditor.

Audit quality research posits that audit-firm size affects audit quality and that larger audit firms provide higher audit quality because they have more to lose from acting opportunistically (DeAngelo 1981b). The collective empirical evidence from the U.S. is strongly supportive that audits of large (Big 4) audit firms are of higher quality (Francis 2004, 353). For example, Teoh and Wong (1993) find that earnings response coefficients of Big Eight clients are significantly higher, indicating that investors perceive Big Eight to supply higher quality audits. Khurana and Raman (2004), using ex ante cost of equity capital as proxy for perceived audit quality, find that a Big 4 audit is associated with higher perceived audit quality in the U.S., but not in Australia,

⁶ In an unpublished study on Australian data for 1993-1994, Gul et al. (2006) find that earnings response coefficients are decreasing in NAS provided by the incumbent auditor. The authors argue that institutional incentives for auditors to remain independent may be lower in Australia than in the U.S. because of lower litigations risk. Gul et al. call for more studies in low litigation environments. Australia may, however, no longer be characterized as a low litigation environment.

Canada, and the U.K.^{7,8} The limited European evidence on the effect of audit firm size on audit quality differentiations, typically proxied by earnings management and audit reporting, is mixed (Eilifsen and Willekens 2008). Based on the above discussion, it seems ex-ante not clear if the Big 4 represents higher audit quality for Norwegian public companies.

Based on reasoning and integration of the two of streams of literature discussed above, we form the following hypothesis:⁹

Hypothesis 1: The relationship between stock returns and earnings is negatively related to the extent of NAS provided by the incumbent auditor, but the effect is moderated if the auditor is from a Big 4 firm.

In the fall 2001, it was revealed that top executives at the energy giant Enron had been deceiving investors by fraudulently overstating the company's earnings. The Enron fraud and Enron's later collapse was followed by a series of high-profile accounting scandals all over the world. The widespread nature and dimension of the scandals caused the public and investors to doubt the integrity of the system of corporate accountability, including the role of the auditors. The audit firms' aggressive sales of NAS to audit clients and potential impairment of auditor independence caused public outcry. This put great pressure on the regulators to restore public confidence through stricter regulation. The international dimensions of the confidence crisis meant that international and regional regulation was affected and that regulatory measures taken in major capital markets such as the Sarbanes-Oxley Act of 2002 in the U.S. exerted worldwide

⁷ The result of Khurana and Raman (2004) suggests that litigation exposure (lower in Australia, Canada, and the U.K. than in the U.S.) rather than reputation protection drives perceived higher audit quality provided by Big 4.

⁸ Gul et al. (2006) find evidence in their sample of Australian firms from 1993-1994 that the negative effect on earnings response coefficients associated with NAS is moderated if the service provider is from one of the largest audit firms.

⁹ We state the hypothesis as an alternative to the null hypothesis.

influence.¹⁰ The turmoil, starting with Enron and the following regulatory initiatives highlighting threats to auditor independence from provision of NAS to audit clients, also hit Norway.¹¹

During 2002 and the first half of 2003 the Financial Supervisory Authority of Norway investigated the major audit firms for possible breaches of the regulations of the provision of NAS to audit clients in the Norwegian Act on Auditing and Auditor.¹² Their findings made public in spring 2003 were alarming and caught the media's attention. The Supervisory Authority concluded that all the investigated audit firms' scope and volume of provision of NAS endangered auditors' independence and objectivity. Eight auditors' provision of NAS was deemed illegal. The auditor profession claimed that the Supervisory Authority conclusions were based on a de facto new and significantly tightened interpretation of the legal rules.¹³ In June 2003 the Supervisory Authority proposed for the Ministry of Finance to introduce legal prescriptions on auditors' provision of NAS following the Supervisory Authority's interpretation of the Act on Auditing and Auditor. At this point, few doubted that the Supervisory Authority had a good case, and the audit firm announced that they were in the process of reorganizing their services offered to audit clients.¹⁴ Based on a proposal from the Supervisory Authority, new prescriptions on the provision of NAS to audit clients took effect from October 2005. We expect,

¹⁰ Including the European Commission's issue of "Recommendation on the Statutory Auditors' Independence in the EU: A Set of Fundamental Principles" in 2002, expected by the Commission to be immediately applied throughout the EU audit industry, and a revision of the IFAC Code of Ethics for Professional Accountants finalized in 2005.

¹¹ The Norwegian Institute of Public Accountants organizes the auditors in Norway and is a member of IFAC. No IFAC member body is allowed to apply less stringent standards than those in the IFAC Code of Ethics. Norway is not member of the European Union (EU). The European Economic Area (EEA) unites, however, the 27 EU member states and the three European Free Trade Association (EFTA) states, Iceland, Lichtenstein, and Norway. This implies among other things that EU regulatory measures of auditing apply to all EEA states, including Norway.

¹² 10 clients for each of the then five large audit firms were investigated.

¹³ The Norwegian Act on Auditing and Auditor includes a general legal clause stating: "An auditor who audits the annual accounts of an entity subject to a statutory audit shall not provide consulting and other non-audit services to that entity if doing so might influence or raise doubt about the auditor's independence and objectivity." (Paragraph 4-5, first section.) The proposed and later effected new legal prescriptions listed specific functions and services that if filled or provided by the auditor, would imply intolerable self-review threats to independence. In addition the prescriptions introduced a new requirement that the auditor shall not end up in a situation where the total fees from NAS to the auditee is consistently substantial relative to the audit fee.

¹⁴ A press release in April 2003 from the Financial Supervisory Authority supports that such changes in fact took place stating that "the audit firms as a response to criticism had reorganized and changed their offering of NAS".

however, that the post-Enron years before 2005 were the most critical for investors' concerns about NAS to audit clients, especially the year 2003. In 2003 the result of Supervisory Authority's investigation was disclosed and stricter prescriptions on the provisions of NAS were proposed, a number of other regulatory initiatives took place,¹⁵ Norway experienced one of its largest auditing scandals ever¹⁶ and the accounting scandals hit Europe in full scale.¹⁷

In addition to new audit regulation, accounting regulation changed during 2003-2006. From 2005, most firms listed on the OSE were required to report according to International Financial Reporting Standards (IFRS). This shift from Norwegian Generally Accepted Accounting Principles (NGAAP) to IFRS may affect earnings response coefficients. Beisland and Knivsflå (2008) find that earnings response coefficients for OSE-listed companies declined from 2005 due to more reporting of revaluation gains and losses according to IFRS than NGAAP. Other studies find that transitory or non-recurring items such as fair value revaluations are found to be less value relevant than recurring items (e.g., Hann et al. 2007). This suggests that the change in accounting regulation may work in the opposite direction of the expected change in earnings response coefficients from audit regulation initiatives.

From the discussion above we form the following hypothesis:

¹⁵ Already in 2002 the Financial Supervisory Authority proposed new regulation that auditors' legal independence requirements should also apply to entities that appear to be a joint operation with the provider of audit services. In 2003 the Norwegian Institute of Public Accountants issued more specified guidelines for the legal requirement to report on auditors' fees in the notes to the financial statements. The guidelines follow the EU Commission's recommendation of splitting auditors' fees into statutory audit services, further assurance services, tax advisory services, and other non-audit services. Finally, by the end of 2003 a draft of the first Code of Practice for Corporate Governance for Norwegian listed companies was issued.

¹⁶ In February 2003 a high-profiled Norwegian brokerage firm of sponsor services collapsed and their auditor from Ernst & Young came under fire. Among the criticism were high NAS fees in the years prior to the bankruptcy. In 2006 the court decided that Ernst & Young had been negligent and awarded 100 million Norwegian kroner (about \$17 million) in damages to the main creditor.

¹⁷ During 2003 the accounting scandals of large Dutch food retailer Royal Ahold and the Italian dairy giant Parmalat were revealed.

Hypothesis 2: The negative effect of NAS on earnings response coefficients was higher the closer in time to the accounting failures and to the Financial Supervisory Authority's investigation of audit firms' provisions of NAS.

III. RESEARCH DESIGN

This section outlines the approach used to test the two hypotheses specified in the previous section. Our focus is on regression models where stock market returns are explained by accounting and auditing variables, allowing for interactions within and between both types of variables.

According to Easton and Harris (1991), the value relevance of earnings could be tested by the simple model:

$$(1) \quad RET = \alpha_0 + \alpha_1 \cdot EARN + \varepsilon,$$

where RET is stock market return of firm j in period t , EARN is the earnings per share divided by the previous period's stock price, ε is the error term of the regression model, and α_0 and α_1 are the regression coefficients to be estimated, for example by ordinary least squares.¹⁸

The price-deflated earnings could be split in a separate level variable LEARN and change variable DEARN, and Model (1) is therefore often specified with two earnings-related variables instead of one.

Furthermore, Model (1) could easily be expanded to allow for interaction or moderation effects:

¹⁸ Statistical inferences about the significance of the earnings response coefficient α_1 should be based on a robust standard deviation within OLS, taking into consideration possible heteroskedasticity and autocorrelation (HAC); see White (1980) and Newey and West (1987). Multi-dimensional clustering could also be adjusted through the standard deviation; see Cameron et al. (2006). Alternatively, the coefficient could be estimated by feasible generally least squares, GLS, taking heteroskedasticity and autocorrelation into consideration through the coefficient estimate, instead of through adjusting the standard deviation of the OLS coefficient. Feasible GLS, however, requires a relatively large number of observations to produce reliable estimates of the covariance matrix; see e.g., Beck and Katz (1995).

$$(2) \quad \text{RET} = \alpha_0 + \alpha_1 \cdot \text{EARN} + \alpha_2 \cdot \text{EARN} \cdot \text{MOD} + \alpha_3 \cdot \text{EARN} \cdot \text{SOD} + \alpha_4 \cdot \text{EARN} \cdot \text{MOD} \cdot \text{SOD} + \alpha_5 \cdot \text{MOD} + \alpha_6 \cdot \text{SOD} + \alpha_7 \cdot \text{MOD} \cdot \text{SOD} + \varepsilon,$$

where the variables MOD and SOD are independent variables potentially affecting the dependent variable RET, and/or are variables moderating the earnings response coefficient, $\text{ERC} = \partial \text{RET} / \partial \text{EARN}$, and $\alpha_2, \alpha_3, \alpha_4, \alpha_5, \alpha_6$ and α_7 are additional regression coefficients. It follows from (2) that

$$(3) \quad \text{ERC} = \alpha_1 + \alpha_2 \cdot \text{MOD} + \alpha_3 \cdot \text{SOD} + \alpha_4 \cdot \text{MOD} \cdot \text{SOD}.$$

In (3), α_1 is the ‘core’ earnings response coefficient and the terms $\alpha_2 \cdot \text{MOD}$, $\alpha_3 \cdot \text{SOD}$ and $\alpha_4 \cdot \text{MOD} \cdot \text{SOD}$ are moderation effects. The coefficient α_2 reveals how the moderator variable MOD is affecting the earnings response coefficient ERC. The sign of α_2 determines whether MOD has a positive or negative effect on ERC. An example of a variable moderating ERC is LOSS in terms of an indicator variable that equals 1 if the firm reports negative earnings and 0 otherwise. Hayn (1995) finds that firm reporting losses have lower ERC, i.e., $\alpha_2 < 0$ when $\text{MOD} = \text{LOSS}$.

It follows from (3) that

$$(4) \quad \partial \text{ERC} / \partial \text{MOD} = \alpha_2 + \alpha_4 \cdot \text{SOD},$$

where SOD functions as a second-order or two-way moderation effect, i.e., a moderation of the first-order moderation effect on EARN working through the variable MOD.¹⁹ When testing

¹⁹ A potential problem with expanding the number of interaction terms is multicollinearity, since EARN simultaneously affects several ‘independent’ variables through interactions. According to Belsley et al. (1980), collinearity is a potential problem in a regression when the condition number is above 20 – and severe if it is above 30. Multicollinearity is only a problem in the tests of Hypothesis 1 and 2 if it affects the test variables – not the control variables. If severe multicollinearity is detected in relation to test variables, e.g., by high variance inflation factors, the coefficients of control variables could be restricted to their expected sign by theoretical and/or empirical studies to avoid too arbitrary loading on the coefficients of test variables (Hill and Adkins 2003), either by inequality-constrained OLS or ML. A way of restricting the sign of a coefficient is to drop it, i.e., to restrict the value to zero. Collinearity could also be reduced by removing insignificant variables through, for instance, stepwise

our Hypothesis 1, specified in Section II, the focus must be on a specification of the earnings response coefficient like the one given by (3) with a variable representing the extent of NAS as the first-order moderation effect MOD; for example, the non-audit service ratio (NASR). In (3) there must also be a variable representing audit quality as the second-order moderation effect SOD; for example, BIG4, indicating that the reporting firm's auditor is from one of the four largest audit firms, especially concerned with their reputational capital. Thus, Hypothesis 1 specified in Section II implies that $\alpha_2 < 0$ and $\alpha_4 > 0$, i.e., that non-audit service NASR has a significantly negative effect on ERC, as increased economic bonding is considered negative for the informativeness of earnings, and audit quality BIG4 has a significantly positive effect on ERC, as high quality audits increases the value relevance of reported earnings; see (4). Notice that (3) controls for the possibility that BIG4 affects the ERC directly, presumably $\alpha_3 > 0$.

Hypothesis 2 implies that the magnitude of the coefficients α_2 and α_4 is reduced (in absolute value); thereby suggesting that the statistical significance of the result implied by Hypothesis 1 deteriorates the more distant the observations are from the year 2003 when the turmoil following the Enron scandal was imminent and the result of the Supervisory Authority's investigation was disclosed. Hypothesis 2 could be tested by partitioning the sample in two periods, the early post-Enron period and the subsequent period, and then testing for structural differences between pairs of coefficients (Chow 1960). This means that Hypothesis 2 could be tested by introducing an indicator variable which equals 1 for the period closest to the Enron debacle and 0 in the later period when new regulation is in place, and then expanding Model (2) by a third-order moderation effect to capture whether the first and the second moderation effects differ over the two periods.

regressions. Another approach to reduce multicollinearity is to center the variables when involved in interaction effects. But in this case, we must be careful when interpreting the coefficients as they are affected by the centering.

IV. DATA AND DESCRIPTIVE STATISTICS

In this section we present the sample, define variables to be analyzed and present descriptive statistics. The data is analyzed in the next section, both by binary correlations and multiple regressions.

We employ a set of data from the Oslo Stock Exchange (OSE) to test the two hypotheses specified in Section II. According to Table 1, Panel A, the number of firm-year observations from firms listed on OSE at the end of their accounting year over the four-year period 2003-2006 is 780. This sample is reduced by 90 because the firm was not listed by the end of their previous accounting year, so that stock market return for the full year could not be calculated, and by 60 because there is a lack of accounting or auditing data in the database. This means that our full sample contains 630 firm-year observations, which involves 187 individual firms over the period.

- INSERT TABLE 1 ABOUT HERE -

To control for possible extreme tails, we truncate the pooled distribution of price-deflated earnings and stock returns at their 1st and 99th percentile, which is common in these types of studies. This means that 20 extreme observations are removed or 3.2 percent of the potential sample. The selected sample is therefore 610 firm-year observations of the variables defined in Table 1, Panel B.²⁰ The effect of truncating the data is analyzed as a robustness test in Section V.²¹

Table 1, Panel C, presents the descriptive statistics of the variables in the selected sample. The average stock return is 32.0 percent, revealing that the years 2003-2006 were bullish on the

²⁰ The variables are collected from various public sources. The stock market return and corresponding accounting data are mostly obtained from Amadeus, a stock market database at the Norwegian School of Economics and Business Administration (NHH); the interest rate data is obtained from the Central Bank of Norway. The auditing and some accounting data are hand-collected from the annual reports.

²¹ Alternatively, we could winsorize rather than delete extreme observations through truncation. If observations above the 99 percentile is replaced by the value of the 99 percentile, and observations below the 1 percentile is replaced by the value of the first percentile, our conclusions are not changed.

OSE.²² The average earnings per share, divided or deflated by the previous accounting year's stock price, is 4.1 percent, suggesting that a substantial part of the increase in stock returns comes from expected future growth opportunities. The median price-deflated earnings per share is 7.8 percent. Of the 610 firm-year observations in the sample, 22.0 percent report losses, i.e., negative earnings.

The audit fee and the non-audit fee to the audit firm are 0.3 percent and 0.2 percent of the initial stock market value. The non-audit fee ratio, defined as the non-audit fee in percentage of total fee, is 34.2 percent on average. 90.0 percent of the observations relate to one of the BIG4 audit firms (Deloitte, Ernst & Young, KPMG or PricewaterhouseCoopers). The average market share of the audit firm is 33.4 percent among the listed firms in the industry of the reporting firm, and 26.1 percent of the audits are done by audit firms that can be characterized as specialists with more than 50 percent of the audit market in that industry.²³

Further characteristics of the reporting firms are also found in Panel C: reporting firms have on average 24.5 percent intangible assets and 3.0 percent deferred taxes in percentage of the initial stock market value of equity. 35.2 percent of the firms issue new equity (measured net of dividends), and the average growth in total assets is 28.6 percent. Furthermore, the average beta, which is a measure of systematic stock market risk, is 1.015. The average firm size is 6.728 when size is measured as the logarithm of the market value of equity. This means that the corresponding market value of equity is about NOK 835 million ($= e^{6.728}$) or about € 100 million, and equals approximately the median. The average market value is NOK 7.466 billion or about € 900 million. The average book-to-market ratio is 0.884, when the current year's earnings are

²² The Oslo Stock Exchange Benchmark Index, OSEBX, increased from 115.2 at the end of 2002 to 440.4 at the end of 2006.

²³ An industry specialist is an audit firm specializing in clients from specific industries. We proxy industry specialization by the market share within an industry (Lim and Tan 2008). The sensitivity of alternative levels of the required market share to be an industry specialist has been examined and our results are robust; see Table 6, Panel C.

deducted from the book value to avoid double counting in the forthcoming regression models. The previous year's stock return is on average 18.2 percent, relative to 32.0 percent in the current year, giving insights into the momentum in the stock return generating process. The average financial leverage (or gearing), defined as debt (both operational and financial) in percentage of the initial market value of equity, is 3.033. Liquid asset in percentage of equity is 33.2 percent.

V. EMPIRICAL ANALYSES AND RESULTS

In this section, we analyze the data described in Section IV. In the first subsection, we report binary correlation between key variables such as stock return, earnings or characteristics about the audit behind earnings. Then, in the second subsection, we give a simple first step analysis by multiple ordinary least squares regressions. The focus is on whether the basic return-earnings relationship is affected by audit characteristics, especially the extent of NAS and the perceived quality of the audit provider. In the two following subsections, we extend the analysis by focusing on abnormal NAS instead of the magnitude of NAS per se – and risk-adjusted stock return instead of raw return. Some further robustness tests are performed in the last subsection.

Simple Correlations between Return and Accounting or Auditing Variables with Interactions

Table 2, Panel A, presents the binary correlation between stock return and earnings or audit related variables.

- INSERT TABLE 2 ABOUT HERE -

Stock return RET, i.e., the market return on the initial market value of equity, is positively correlated with earnings EARN, i.e., the accounting return scaled by the initial market value of equity, and negatively correlated with negative earnings LOSS. As expected, EARN is also negatively correlated with LOSS.

The auditing variables, here represented with non-audit service ratio NASR and big four audit firm BIG4, are not significantly correlated with stock return RET. It seems that the audit has no direct influence on RET, at least univariately. However, EARN is significantly negatively correlated with NASR, consistent with that purchase of non-audit service reduces current earnings. Thus, non-audit service NASR leads to reduced accounting earnings EARN and reduced EARN influences RET negatively; compare the multivariate analysis in the next subsections. This also makes NASR positively correlated with LOSS. Finally, NASR and BIG4 are positively correlated with each other, suggesting that Big 4 firms provide relative more NAS than non-Big 4 firms.

Table 2, Panel B, presents the correlation between stock return RET and several interaction effects with earnings EARN, that will be examined in the forthcoming multivariate analyses. RET is positively correlated with especially EARN in firms audited by a big four audit firm BIG4. The Pearson correlation coefficient between RET and the non-audit service ratio NASR is only weakly significant, but the interaction effect $RET \cdot NASR$ becomes stronger if it is moderated by BIG4. The correlations between interaction effects are high, due to a common underlying variable EARN, suggesting potential multicollinearity problems when running regressions involving these interactions; see the last subsection for further analysis and discussion.

Multiple Regression – Simple First Stage Analysis

Table 3, Panel A, displays the result of regressing raw stock market return RET on earnings EARN, including a small set of moderators MOD and secondary moderators SOD, potentially affecting the earnings response coefficient ERC; see Model (2) with ERC given by (3). In the regression model reported in Panel A, $MOD = (LOSS, NASR)$ and $SOD = BIG4$, meaning that

there is only one secondary moderation effect and that is relative to EARN · NASR.²⁴ Thus, there is no secondary interactions SOD relative to either EARN · LOSS or EARN · BIG4.

First, the ‘core’ earnings response coefficient is estimated at 2.326, which corresponds to α_1 in the ERC given by (3). It is highly significant, i.e., at the 1 percent level.²⁵ If the earnings is negative, the response coefficient is moderated toward zero, as the coefficient of the interaction EARN · LOSS equals -1.781, corresponding to α_{21} in (3), where the second number in the subscript refers to LOSS being the first MOD variable (see the text accompanying Table 3 for a full model specification), which is highly significant at the 1 percent level. This finding is consistent with Hayn (1995) on U.S. data. Investors attach less weight to negative than positive earnings.

- INSERT TABLE 3 ABOUT HERE -

Second, there are two interactions between earnings and audit variables that are significant. The earnings response coefficient ERC given by (3) is moderated negatively, if the audit firm is supplying NAS in addition to the mandatory audit service. This is seen in Panel A by the coefficient of the interaction term EARN · NASR, corresponding to α_{22} in (3), where the second number in the subscript refers to NASR as the second MOD variable, being estimated at -6.761 with a p-value equal to 0.000. Investors weight earnings less for companies where the incumbent provides NAS. Investors may fear that there is bonding between the firm and its audit firm as a consultant, leading to less credible earnings being reported to the stock market. However, this

²⁴ We find that BIG4 is the best representation of the second-order moderator in our sample. Regression models with the alternatives SHARE, SPEC and perhaps CHAN obtain adjusted R^2 less than that obtained by BIG4. We enter several of these variables simultaneously as a robustness test in the last subsection; see Panel C of Table 6.

²⁵ We uses robust inferences that are adjusted for potential heteroskedasticity and first-order autocorrelation (White 1980; Newey and West 1987), even though the Breusch-Pagan test for heteroskedasticity is not able to reject the null hypothesis of constant standard deviation and the Arellano-Bond test for autocorrelation is not able to reject the null hypothesis of no autocorrelation in Table 3, Panel A. In several later models, especially heteroskedasticity is detected, making robust inferences necessary. We therefore choose to apply them to all regression models, except in Table 6, Panel B, where the coefficients estimates are adjusted by employing GLS.

effect should weaken if the audit firm is viewed to be of high ‘quality’. Taking big four audit firms as a proxy of audit quality, we observe that the interaction variable $EARN \cdot NASR \cdot BIG4$ has a coefficient, corresponding to α_4 in (3), equal to 6.758 with a p-value equal to 0.000. Thus, investors consider the earnings reported by firms with Big 4 auditors as more reliable than firms with non-Big 4 auditors, supplying NAS; see also (4). These findings are consistent with Hypothesis 1 specified in Section II, leading to a rejection of the corresponding null hypothesis.^{26,27} Furthermore, these findings are consistent with those obtained by Gul et al. (2006) from Australian data from the period 1993-1994. The positive effect of Big 4 on ERC is also consistent with the findings of Teoh and Wong (1993) on U.S. data.

Table 3, Panel B, presents the regression results when the data are divided into the sub-periods 2003-2004 and 2005-2006, i.e., the period closest to the Enron scandal and the point in time when the Supervisory Authority in Norway announced its heavy criticism of the audit firms’ provision of NAS. The moderation effect of NASR on EARN is estimated to be -7.687 in the first sub-period and reduced to -3.984 in the latter sub-period; the moderation effect of BIG4 on $NASR \cdot EARN$ is 7.547 in 2003-2004 and only 2.141 in 2005-2006. Yearly analyses reveal that the effect in 2003-2004 is foremost driven by observations in 2003; see Panel C of Table 3. The coefficient of $EARN \cdot NASR$ is -10.253 in 2003, and the coefficient of $EARN \cdot NASR \cdot BIG4$ is 9.774. In the years 2004, 2005 and 2006, the coefficients are not significant year-by-year. Pooled

²⁶ The statistical significance of the result is also obtained at the 1% level if employing cluster robust standard deviations, for example allowing forth-dimensional clustering on years, reporting firms, industries and auditor firms; see Cameron et al. (2006). One-dimensional clustering on firms, which is most common clustering variable, yields the same conclusion.

²⁷ If we employ the price-deflated non-audit service fee NASF instead of the non-audit service ratio NASR, the conclusion becomes less clear as the measure of non-audit service is not seen relatively to the extent of the mandatory audit service. However, if we utilize NASF and simultaneously control (linearly) for the price-deflated audit fee AUDF, we obtain the same conclusion as with NASR alone, i.e., with one variable representing NASF relative to the total fee, $AUDF + NASF$.

together, however, they are -3.551 and 3.743, which is moderately significant (p-values: 0.051 and 0.042).

Testing jointly whether the coefficients of the two variables $EARN \cdot NASR$ and $EARN \cdot NASR \cdot BIG4$ differ between the two sub-periods 2003-2004 and 2005-2006 through the Chow test, in which an indicator variable for the two periods are utilized in a pooled regression, yields an insignificant test statistic. However, testing 2003 versus 2004-2006 yields a significant test statistic at the 5 percent level, applying robust standard errors.^{28,29} Our findings in Table 3 are consistent with Hypothesis 2 outlined in Section II. After the Enron scandal in 2002-2003 and in the heat of the criticism of the audit firms' provision of NAS from the Supervisory Authority, there was concern about bonding between reporting firms and their auditors, leading to less earnings response coefficients in firms with relatively high NAS, moderated if the audit firm is a Big 4 firm. After new regulation was introduced and allowed to work in 2004-2006, the concern is reduced and as is the negative effect on earnings response coefficients.

In 2005, most firms listed on the OSE shifted from Norwegian Generally Accepted Accounting Principles (NGAAP) to International Financial Reporting Standards (IFRS) due to mandatory regulation required by the European Union of all member states of the European Economic Area. As discussed, this shift in reporting regime may affect earnings response coefficients, presumably reducing them as more transitory revaluation gains are reported

²⁸ The coefficient of the variable $EARN \cdot NASR \cdot D03$, where D03 is an indicator variable for the year 2003, is estimated at -6.072 (p-value = 0.033) and the coefficient of $EARN \cdot NASR \cdot BIG4 \cdot D03$ is estimated at 6.031 (p-value = 0.056). The joint hypothesis that both coefficient are zero, suggesting no structural break, is rejected (F = 3,45; p-value = 0.032).

²⁹ We have also considered 2002, which is not included in the main analysis because this analysis involves lagged variables – and we do not have access to audit fee data prior to 2002. However, in Table 3 we do not use lagged variable and 2002 could be included. We find that the two audit-related regression coefficients are not significant in 2002, as they are in 2004-2006. The test 2003 versus 2002 and 2004-2006 yields a significant test statistic. If we utilize GLS to estimate the coefficients, as we do in Table 6, Panel B, the negative effect caused by NASR in 2002 becomes significant (at the 5% level). But the secondary moderating effect caused by BIG4 is not significant – though positive. A Chow test of 2002-2003 versus 2004-2006 yields a test statistic only moderately significant.

according to IFRS than NGAAP (Beisland and Knivsflå 2008). According to Panel B of Table 3, the core earnings response coefficient is significantly lower in 2005-2006 than in 2003-2004 (1.177 vs. 2.666). However, our test variables EARN · NASR and EARN · NASR · BIG4 do not face structural shifts induced by IFRS. We find only that there is a significant structural shift in these test variables in 2003 relative to 2004-2006, which we interpreted to be consistent with effective audit regulation initiatives.

Abnormal Non-Audit Service Instead of Non-Audit Service as a Control for Endogeneity

A potential problem with the analyses in the previous subsection is that especially the non-audit service ratio NASR may be endogenous, since it is a decision variable of the reporting firm that potentially depends on variables entering directly into the return regression specified and analyzed in Table 3.³⁰

To alleviate possible endogeneity problems we choose to focus on the abnormal non-audit service ratio (see Frankel et al. 2002 and DeFond et al. 2002),

$$(5) \quad ABNASR = NASR - E(NASR | CHAR),$$

in which $E(NASR | CHAR)$ is the expected non-audit service ratio $E(NASR)$ given firm characteristics CHAR. Thus, endogenous effects on NASR caused by CHAR are eliminated in ABNASR.³¹

Panel A of Table 4 specifies a linear regression model for predicting the expected or ‘normal’ non-audit service ratio $E(NASR | CHAR)$. The model depends on a relatively large set of firm characteristics CHAR such as the previous year’s non-audit service ratio LNASR, current

³⁰ Another candidate to endogenize is BIG4, the choice to employ a Big 4 audit firm. However, there is often a cost of endogenizing several variables, and we choose to limit the presentation by endogenizing only one variable. Tests suggest that NASR is more endogenous than BIG4. This is also revealed in Table 2, Panel A. NASR is significantly correlated with EARN, LOSS and BIG4, while BIG4 is only significantly correlated with NASR.

³¹ An alternative approach is to employ two-stage regression. The first stage is to allow NASR to depend on the other independent variables plus a set of instrumental variables unique to the NASR - regression model. In the second stage, the RET - regression is estimated taking the first stage into consideration; confer 2SLS, 3SLS and similar techniques. As a test of robustness, we have also used 3SLS and obtained similar results than those presented.

price-deflated earnings per share EARN, an indicator for negative earnings LOSS, and characteristics about the audit; an indicator for big four audit firm BIG4, an indicator for change of audit firm CHAN, the market share of the audit firm among stock exchange listed firms in a particular industry SHARE, an indicator for audit firm specialist SPEC, defined as having a market share of more than 50 percent within an industry.

Other potential NAS drivers such as intangible assets INTAN (in percentage of the market value of equity MVE), deferred taxes DTAX (in percentage of MVE), an indicator of equity issue ISSUE and the growth rate of total assets GROW also enter the model. Additionally, a rich set of risk variables in terms of BETA (measure of systematic equity risk; confer the Capital Asset Pricing Model), SIZE (confer the proxy-risk factors of Fama and French 1992), BTM (Fama and French 1992), MOM (Carhart 1997), LEV (financial leverage) and LIQ (liquid asset available) is added to the model. Finally, year and industry effects are controlled for by adding an indicator YEAR and IND, making the regression intercept dependent of year and industry.

- INSERT TABLE 4 ABOUT HERE -

The model of $E(\text{NASR} | \text{CHAR})$ reported in Panel A of Table 4 explains 38.6 percent of the variation in the non-audit service ratio NASR. According to Panel A, the most important factor explaining current level of non-audit service NASR is the previous level LNASR. Firms with high NASR in one period on average also have high NASR in the following period. NASR is also influenced positively by the market share of the audit firm SHARE, perhaps because NASR is driven up by high non-audit service fees NASF due to market power. Finally, NASR depends negatively on the size of the reporting firm SIZE, perhaps because large firms do less outsourcing of these services. The residual from the regression model in Panel A is taken as our measure of the abnormal non-audit service ratio ABNASR. Descriptive statistics are presented in Panel B of Table 4.

Table 4, Panel C, presents a version of Model (2) with ABNASR as a moderator of earnings EARN.³² We observe that the results from Panel A and C of Table 3 survive the extension from NASR to ABNASR, controlling for potential year and industry effects represented by the YEAR and IND variables. First, the earnings response coefficient ERC is reduced by ABNASR; the marginal effect is estimated at -9.873, which is significant at the 1 percent level. The effect of ABNASR on EARN is moderated by the auditor coming from a large audit firm, a proxy of audit firm of high quality; the marginal effect on ERC through ABNASR is strongly significant and estimated at 10.188. These observations are consistent with the findings in Panel A of Table 3 and thus Hypothesis 1 specified in Section II. Investors are concerned with abnormal NAS and as reflected in the earnings response coefficients less responsive to earnings, but to a less extent when the reporting firm has employed a Big 4 firm.

Second, the result seems to be driven by observations from 2003, as the effects are strongly significant in this year – but not in the pooled three years 2004-2006. Testing formally by the Chow test whether the difference in coefficient structure regarding $EARN \cdot ABNASR$ and $EARN \cdot ABNASR \cdot BIG4$ yields a significant test statistic (with p-value = 0.019, after applying robust standard errors). This is consistent with the findings in Panel C of Table 3 and thus with Hypothesis 2 specified in Section II. In 2003, investors were highly concerned about abnormal NAS, perhaps because of the Enron scandal and the announced findings of the Norwegian Supervisory Authorities; but this concern was significantly reduced from 2004 to 2006, perhaps due to that new regulation encourages investors' confidence.

³² In relation to Model (2), MOD = (LOSS, ABNASR) and SOD = BIG4, where BIG4 is a secondary moderator of EARN through ABNASR. Thus, there is no secondary moderators SOD in relation to the interaction between EARN and LOSS.

Risk-Adjusted or Abnormal Stock Returns Instead of Raw Stock Returns

Another extension of the return regression model is to account for potential omitted variables. This analysis is extended in the next subsection; see the analysis of the extended set of variables in Panel C of Table 6.

To account for risk, we deduct the raw stock market RET by the expected return $E(\text{RET})$ given relevant risk factors RISK:

$$(6) \quad \text{ABRET} = \text{RET} - E(\text{RET} \mid \text{RISK}),$$

where $E(\text{RET} \mid \text{RISK})$ is the expected return $E(\text{RET})$ conditioned on a set of ex ante risk factors RISK. Potential risk factors are systematic beta risk BETA from the Capital Asset Pricing Model, the Fama and French factors SIZE, measured as the logarithm of the previous year's market value of equity, and the book-to-market ratio BTM, measured as the book value of equity minus earnings divided by the previous year's market value of equity – and the Carhart factor momentum MOM, simply measured as the previous year's stock return; see Fama and French (1992) and Carhart (1997). In addition, the abnormal return ABRET should be cleaned for fixed effects related to year and industry; confer the variables YEAR and IND.

Panel A of Table 5 estimates the expected return $E(\text{RET})$ given the risk factors $\text{RISK} = (\text{BETA}, \text{SIZE}, \text{BTM}, \text{MOM})$, also taking into consideration potential fixed year and industry effects, represented by YEAR and IND. It turns out that only BETA and BTM are significant risk factors on our sample. The residual from the return-risk regression is taken as our measure of abnormal stock return ABRET; descriptive statistics are presented in Panel B of Table 5.

- INSERT TABLE 5 ABOUT HERE -

Panel C of Table 5 reports the regression of the abnormal return ABRET on earnings characteristics EARN and LOSS, and on the audit variables ABNASR and BIG4 with possible interaction effects $\text{EARN} \cdot \text{LOSS}$, $\text{EARN} \cdot \text{ABNASR}$, $\text{EARN} \cdot \text{BIG4}$, $\text{ABNASR} \cdot \text{BIG4}$ and

EARN · ABNASR · BIG4, again allowing for possible year and industry effects YEAR and IND. First, the earnings response coefficient ERC depends negatively on abnormal non-audit service ABNASR; the marginal effect is estimated at -7.557, which is strongly significant. Again, this effect is moderated toward zero if the audit firm is among the four biggest and thereby of high quality, as the coefficient of the indicator variable EARN · ABNASR · BIG4 is 8.072. These findings are consistent with the findings in Panel A of Table 3, Panel C of Table 4 and Hypothesis 1 specified in Section II. Second, this effect is driven by observation from 2003 – and to a lesser extent from 2004-2006. The Chow test of structural break in terms of whether the coefficients of EARN · ABNASR and EARN · ABNASR · BIG4 differ over the two periods yields a significant test statistic (p-value = 0.028 with cluster robust standard errors where the clustering is on audit firm). This is consistent with the findings in the second and third subsections and Hypothesis 2 specified in Section II.

Panel D of Table 5 analyzes whether the reported effects of auditing on the earnings response coefficients of the current level of earnings EARN depend on earnings' components in terms of the previous earnings level LEARN and the current change in earnings DEARN, where $EARN = LEARN + DEARN$. Effect on the response coefficient of the previous earnings level LEARN is virtually the same as for the current earnings level EARN; these results are therefore not tabulated. However, effects of auditing working through the variables ABNASR and BIG4 on the ERC of current year's change in earnings DEARN display similar effects but are less clear and hence less significant than the level results, as seen in Panel D.

Robustness Tests – Full Sample, Feasible GLS, Collinearity, and Further Tests for Omitted Variables

We report the results of three additional robustness tests. Panel A of Table 6 reports the results if the sample is not reduced by twenty ‘extreme’ observations – and thereby containing 630 instead the reduced sample of 610 firm-year observations utilized elsewhere; see Panel A of Table 1.

- INSERT TABLE 6 ABOUT HERE -

We observe that the reintroduction of the ‘extreme’ observations does not alter the results. Refer to Panel A and C of Table 3. The findings are still consistent with Hypothesis 1 and 2. We have also winsorized instead of truncating the sample without any change of conclusions.

Panel B of Table 6 changes the estimation technique of the regression coefficients from ordinary least squares to (feasible) generally least squares, FGLS, with a more general covariance matrix taking into account panel-specific heteroskedasticity and first-order autocorrelation; see Panel C of Table 5 for the corresponding OLS - results. We find that estimation by FGLS yields materially the same results and conclusions as by OLS, suggesting strong estimation robustness. The significance of the FGLS results is ‘better’ than those of OLS with robust standard deviations. However, FGLS in small and moderate samples may lead to ‘overconfidence’; see, e.g., Beck and Katz (1995). Our main focus is therefore on robust OLS.

So far we have purposely ignored the problem of multicollinearity. If we, for instance, calculate the condition number of the model specified in Panel C of Table 5, we obtain 25.6. According to Belsley et al. (1980), this indicates multicollinearity as the value is above 20 – but not ‘severe’ multicollinearity as the value is below 30. Multicollinearity may cause the loading of collinear coefficient to be somewhat arbitrary, making the estimation unstable for different specifications and facing the risk of obtaining coefficients with the ‘wrong’ sign. The variance inflation factors of the two test variables $EARN \cdot ABNASR$ and $EARN \cdot ABNASR \cdot BIG4$ are

above 10, suggesting that they are a contributing source of the multicollinearity. Our findings so far suggest stability across different model specifications in which NASR has been replaced with ABNASR, RET has been replaced with ABRET, and across different estimation techniques – including FGLS and considering fixed time and industry effects.³³

To further analyze the robustness of our findings toward reduced collinearity, we start with the model in Panel C of Table 5. Then we remove stepwise insignificant variables at the 5 percent level, given that EARN, EARN · ABNASR and EARN · ABNASR · BIG4 must be in the model (Hill and Adkins 2003). This does not change the result regarding the significance of the focused variables; the coefficient of EARN · ABNASR and EARN · ABNASR · BIG4 have the same sign as previous – and they are significant at the 1 percent level. The condition number drops from 25.6 to 21.3, which is an acceptable level given the use of uncentered interaction terms.³⁴

Our last remedy against multicollinearity is to center the interaction effects. The condition number of the model specified in Table 5, Panel C, drops from 25.6 to 7.6 with centered interaction effects. Thus, there is no multicollinearity problem, and the variance inflation factors of the test variables are far below the threshold of 10, respectively 1.18 and 1.78 for the two test variables. However, the ‘cost’ of centering is that we must adjust the coefficients by mean effects before interpreting them in accordance with (3).³⁵ The coefficient of EARN · ABNASR · BIG4 is estimated at 8.072, which is (and should be) identical to the uncentered coefficient estimate. It is

³³ Stability could also be examined by employing bootstrapped standard deviations to capture within sample arbitrariness in coefficient loading. If we obtain 1000 samples by drawing observations from the original sample with withdrawal until we have exactly the same number of observations, we get standard deviations that are somewhat higher than the HAC standard deviations. For example, in the first regression of Panel C of Table 5, both test variables are significant at the 1% level. With bootstrapped standard deviations, they are only significant at the 2% level.

³⁴ It is possible to squeeze the condition number under 20 by dropping further variables and still obtain the results claimed by Hypothesis 1 and 2.

³⁵ The earnings response coefficient ERC is given by (3). The mean centered version is $ERC = \beta_1 + \beta_2 \cdot (MOD - \mu_M) + \beta_3 \cdot (SOD - \mu_S) + \beta_4 \cdot (MOD - \mu_M) \cdot (SOD - \mu_S) = (\beta_1 - \beta_2 \cdot \mu_M - \beta_2 \cdot \mu_S + \beta_4 \cdot \mu_M \cdot \mu_S) + (\beta_2 - \beta_4 \cdot \mu_S) \cdot MOD + (\beta_3 - \beta_4 \cdot \mu_M) \cdot SOD + \beta_4 \cdot MOD \cdot SOD$, where μ_M is the mean of MOD and μ_S is the mean of SOD. Compared with (3) this means that $\alpha_1 = \beta_1 - \beta_2 \cdot \mu_M - \beta_2 \cdot \mu_S + \beta_4 \cdot \mu_M \cdot \mu_S$, $\alpha_2 = \beta_2 - \beta_4 \cdot \mu_S$, $\alpha_3 = \beta_3 - \beta_4 \cdot \mu_M$ and $\alpha_4 = \beta_4$.

highly significant. The centered coefficient estimate of EARN · ABNASR is estimated at -0.276, but this estimate has to be adjusted by the mean effect of BIG4, which equals 0.900; see Panel C of Table 2. Thus, the adjusted coefficient estimate is $-0.276 - 8.072 \cdot 0.900 = -7.541$, which is highly significant. We observe that the coefficient of EARN · ABNASR increases from -7.557 to -7.541 when adjusting for multicollinearity by centering. No conclusions are altered when reestimating all regressions with centered interaction effects.

Finally, we add a number of factors that may affect the earnings response coefficients to control for omitted variables. The added first-order moderators of EARN and hence the ERC are INTAN, SHIFT, SHARE, SPEC, BETA, BTM, MOM, LEV and LIQ. The problem is that multicollinearity increases and may reach unacceptable levels; the condition number reaches 40.9. We therefore reduce the number of interactions by removing insignificant variables stepwise so that the condition number becomes 25.7, or 22.4 if fixed effects are ignored. We consider this acceptable. According to Panel C of Table 6, the main results are still consistent with Hypothesis 1 and 2, specified in Section II. The focused audit-related coefficients are estimated at -5.036 and 6.063. They are highly significant. Furthermore, the Chow test testing for jointly time differences between 2003 and 2004-2006 yields a significant test statistic (with p-value = 0.001, after applying cluster robust standard errors). This is consistent with the findings in Table 5, Panel C (in which the corresponding p-value is 0.028).

VI. CONCLUSIONS

This study investigates whether the economic bonding between the auditors and their clients caused by the provision of NAS affects investors' perception of auditors' independence as reflected in earnings response coefficients. Our study is motivated by the small number of prior studies, inconclusive prior results, and the lack of post-Enron period studies. Our results show that high uses of NAS are associated with reduced earnings response coefficients, based on data

from firms listed on the Oslo Stock Exchange in Norway over the years 2003-2006. This association is, however, moderated when the auditor is from a Big 4 audit firm, a common proxy for audit quality. We also find that the year closest to the Enron debacle (i.e., 2003), when the Norwegian supervisory authority announced that the major audit firms have too aggressively provided NAS, drives our main result. This indicates that regulatory initiatives in the wake of the Enron scandal and perhaps a refocus of the audit firms on audit quality and their service portfolio have relieved investors' concerns for auditors' provision of NAS. This evidence was provided in low litigation environment (Norway) where the provision of NAS is expected to cause more concern for investors than in a more litigious setting. Our findings are stable across different model specifications and after robustness tests controlling for multicollinearity and omitted variables in our simplest specifications.

Although our findings provide evidence that investors perceive provision of NAS problematic and that regulatory initiatives may relieve such negative perception, caution should be exerted when making extrapolations of the results and policy prescriptions. First, our findings show that investors' concerns are not stable over time. Second, an analysis of auditor independence may require a more comprehensive analysis of incentives and institutional setting in which the auditor-client operate (Francis 2006) than we have provided through our set of control variables. As always, there might still be omitted variables that we are unaware of.

Our paper investigates whether investors' response to earnings is affected by the level of NAS, i.e., investors' perceptions. Thus, we do not answer the question whether auditors can appear dependent when they actually are independent. Dopuch et al. (2003) show in an experiment that investors' perceptions of independence may be impaired regardless of whether independence in fact is impaired. It is not clear if their finding in an experimental setting extends to our market setting.

The efficient market hypothesis suggests that share prices will seldom reflect inaccurate investors' beliefs about auditors' independence in fact. We cannot exclude, as pointed out by Lim and Tan (2008, 200), that the finding of a negative association between NAS and investors' response to earnings may reflect that investors overreact in responses to the possibility of impairment of audit quality when, in fact, this is either not the case or is restricted to a small subset of firms/NAS classes. For example, we cannot rule out that investors' perceptions in our study are driven purely by anxiety (e.g., negative attention from regulators or the business press) potentially unrelated to auditors' independence in fact. Future research is needed to assess the degree of correspondence between independence in appearance and in fact.

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TABLES

Table 1: Sample, Variable Definition and Descriptive Statistics

Panel A: Sample Selection

		2003-2006
	Number of firms listed on OSE at the end of the accounting year	780
-	Firms without stock return for the whole accounting year	90
-	Firms lacking the <u>full</u> set of accounting and auditing data	60
=	Available firm-year observations	630
-	Truncation of earnings and stock returns	20
=	Selected sample	610

Panel B: Definition of Variables in the Sample

RET	Excess logarithmic stock market return of firm j ($= 1, 2, \dots, 187$) in year t ($= 2003, 2004, 2005, 2006$), where excess means return in excess of the estimated risk free rate. The risk free rate of return is taken to be the one month effective Nibor rate (which is an inter-bank borrowing rate), adjusted for 28% tax and a risk premium of 10%, i.e., the risk free rate $= \text{Nibor01M} \cdot (1 - 0.28) \cdot (1 - 0.1)$
EARN	Reported earnings per share divided by previous year's stock price, i.e., at the end of the previous year
LOSS	Indicator variable for negative level of earnings. That is, it equals 1 if $\text{EARN} < 0$, and 0 otherwise
AUDF	Audit fee as reported in the financial statement divided by the previous year's stock market value
NASF	Non-audit fee as reported in the financial statement divided by the previous year's stock market value
NASR	Non-audit service ratio, i.e., $\text{NASF}/(\text{AUDF} + \text{NASF})$
BIG4	Indicator variable that equals 1 if the audit firm is one of the Big 4 (Deloitte, E&Y, KPMG or PwC), and 0 otherwise
CHAN	Indicator variable that equals 1 if of the reporting firm changed audit firm during the year, and 0 otherwise
SHARE	Market share of the audit firm in an industry in a particular year for stock listed firms. The market share is measured relative to total auditing fee, i.e., $\text{AUDF} + \text{NASF}$
SPEC	Indicator variable that equals 1 if the audit firm is specialized in an industry, i.e., has a market share of over 50% in an industry, and 0 otherwise
INTAN	Intangible assets divided by the previous year's stock market value
DTAX	Deferred taxes divided by the previous year's stock market value
ISSUE	Indicator variable that equals 1 if there is a net equity issue, i.e., $\text{new capital} - \text{dividend} > 0$, and 0 otherwise
GROW	Growth in total assets, measured as the percentage growth from the beginning to the end of the year
BETA	Beta is an estimate of systematic risk, where BETA is estimated on the time series 60 months before the year end. If less data is available, BETA is estimates on shorter and shorter time series
SIZE	Firm size is a proxy risk factor and measured by the logarithm of previous year's stock market value
BTM	Book-to-market ratio is a proxy risk factor. The book-value of equity is reduced by earnings (which is represented through the variable EARN) and the market value equals the previous year's stock market value
MOM	Momentum is a proxy risk factor and measured by the previous year's excess return, i.e., MOM equals LRET which means that RET is lagged by one year
LEV	Leverage measured by book value of debt divided by the previous year's stock market value of equity
LIQ	Current or liquid assets minus short term debt divided by the previous year's stock market value of equity

Panel C: Descriptive Statistics for the Selected Sample

	Obs.	Mean	St. dev.	25-percent	Median	75-percent
RET	610	0.320	0.430	0.060	0.288	0.528
EARN	610	0.041	0.317	0.009	0.078	0.131
LOSS	610	0.220	0.414	0.000	0.000	0.000
AUDF	610	0.003	0.006	0.001	0.001	0.003
NASF	610	0.002	0.004	0.000	0.001	0.002
NASR	610	0.342	0.174	0.224	0.334	0.449
BIG4	610	0.900	0.300	1.000	1.000	1.000
CHAN	610	0.039	0.195	0.000	0.000	0.000
SHARE	610	0.334	0.261	0.126	0.269	0.518
SPEC	610	0.261	0.439	0.000	0.000	1.000
INTAN	610	0.245	0.505	0.012	0.077	0.277
DTAX	610	0.030	0.079	0.000	0.000	0.018
ISSUE	610	0.352	0.478	0.000	0.000	1.000
GROW	610	0.286	0.969	0.001	0.105	0.265
BETA	610	1.015	0.714	0.412	0.890	1.525
SIZE	610	6.728	1.774	5.528	6.544	7.875
BTM	610	0.884	1.049	0.379	0.625	0.966
MOM	610	0.182	0.676	-0.068	0.209	0.503
LEV	610	3.033	4.498	0.411	1.124	3.058
LIQ	610	0.332	0.837	0.031	0.183	0.465

Truncation means that the 1% highest and lowest observations of EARN and RET have been removed. The sample is reduced by 20 or 3.2% 'extreme' observations (tails). Notice that $3.2\% < 2 \cdot 2\% = 4\%$, due to overlapping observations.

Table 2: Correlation Matrix – Selected Variables**Panel A:** Return, Earnings and Some Audit Characteristics

	RET	EARN	LOSS	NASR	BIG4
RET		0.458 *** (0.000)	-0.226 *** (0.000)	0.036 (0.381)	0.003 (0.935)
EARN	0.167 *** (0.000)		-0.717 *** (0.000)	-0.107 *** (0.008)	-0.020 (0.627)
LOSS	-0.209 *** (0.000)	-0.535 *** (0.000)		0.081 ** (0.044)	0.045 (0.269)
NASR	0.034 (0.403)	-0.116 *** (0.004)	0.083 ** (0.039)		0.159 *** (0.001)
BIG4	-0.017 (0.674)	-0.052 (0.197)	0.045 (0.269)	0.166 *** (0.000)	

Panel B: Some Interaction Effects with Earnings

	RET	EARN · LOSS	EARN · NASR	EARN · BIG4	EARN · NASR · BIG4
RET		0.217 *** (0.000)	0.395 *** (0.000)	0.429 *** (0.000)	0.386 *** (0.000)
EARN · LOSS	-0.014 (0.731)		0.721 *** (0.000)	0.717 *** (0.000)	0.712 *** (0.000)
EARN · NASR	0.079 * (0.051)	0.839 *** (0.000)		0.865 *** (0.000)	0.949 *** (0.000)
EARN · BIG4	0.160 *** (0.000)	0.924 *** (0.000)	0.859 *** (0.000)		0.923 *** (0.000)
EARN·NASR·BIG4	0.086 ** (0.033)	0.837 *** (0.000)	0.996 *** (0.000)	0.862 *** (0.000)	

The Spearman correlation coefficient is reported above the diagonal, while the Pearson correlation coefficient is reported below. The values in parentheses are the p-value of the respective correlation coefficients. The asterisks ***, ** and * indicate significance at the 1% (strongly significant), 5% (significant) and 10% level (weakly significant and not emphasized). These coefficients are based on the truncated sample of 610 matched observations; see Table 1, Panel A.

Table 3: The Value Relevance of Audited Earnings Disclosures: Impact of Non-Audit Service and Moderation by Audit Quality – Simple First Stage Analysis

Panel A: Simple Test of Hypothesis 1: 2003-2006

	Predicted sign	RET	p-value (HAC)
EARN	+	2.326 ***	0.000
EARN • LOSS	-	-1.781 ***	0.000
EARN • NASR	-	-6.761 ***	0.000
EARN • BIG4	+	-0.754	0.123
EARN • NASR • BIG4	+	6.758 ***	0.000
LOSS		-0.110 **	0.037
NASR		1.000 ***	0.000
BIG4		0.195 **	0.049
NASR • BIG4		-0.868 ***	0.004
Intercept		-0.073	0.399
Adjusted R ²		0.248 ***	0.000
Observations		610	

Panel B: Simple Test of Hypothesis 2: 2003-2004 versus 2005-2006

Period – Variable	2003-2004			2005-2006		
	RET	p-value (HAC)		RET	p-value (HAC)	
EARN	2.666 ***	0.000		1.177		0.252
EARN • LOSS	-1.779 ***	0.000		-2.198 ***		0.000
EARN • NASR	-7.687 ***	0.000		-3.984		0.164
EARN • BIG4	-0.993 **	0.013		0.772		0.493
EARN • NASR • BIG4	7.547 ***	0.000		2.141		0.497
LOSS	-0.125 *	0.062		-0.195 **		0.021
NASR	1.291 ***	0.001		0.421		0.216
BIG4	0.406 ***	0.005		-0.158		0.308
NASR • BIG4	-1.415 ***	0.001		0.089		0.814
Intercept	-0.148	0.248		0.127		0.358
Adjusted R ²	0.325 ***	0.000		0.177 ***		0.000
Observations	307			303		

Panel C: Simple Test of Hypothesis 2: 2003 versus 2004-2006

Period – Variable	2003			2004-2006		
	RET		p-value (H)	RET		p-value (HAC)
EARN	2.716	***	0.000	1.638	***	0.003
EARN • LOSS	-1.389	***	0.000	-1.934	***	0.000
EARN • NASR	-10.253	***	0.000	-3.551	*	0.051
EARN • BIG4	-1.140	***	0.009	-0.199		0.734
EARN • NASR • BIG4	9.774	***	0.000	3.743	**	0.042
LOSS	-0.010		0.927	-0.178	***	0.002
NASR	1.392	**	0.039	0.419		0.102
BIG4	0.498	**	0.019	0.008		0.931
NASR • BIG4	-1.790	**	0.011	-0.095		0.733
Intercept	-0.063		0.747	0.029		0.695
Adjusted R ²	0.342	***	0.000	0.225	***	0.000
Observations	152			458		

The estimated regression model is a version of Model (2): $RET = \alpha_0 + \alpha_1 \cdot EARN + \alpha_{21} \cdot EARN \cdot LOSS + \alpha_{22} \cdot EARN \cdot NASR + \alpha_3 \cdot EARN \cdot BIG4 + \alpha_4 \cdot EARN \cdot NASR \cdot BIG4 + \alpha_{51} \cdot LOSS + \alpha_{52} \cdot NASR + \alpha_6 \cdot BIG4 + \alpha_7 \cdot NASR \cdot BIG4 + \varepsilon$, where RET is stock return, EARN is earnings (deflated by previous years' earnings), LOSS is an indicator for negative earnings, NASR is the non-audit service ratio, i.e., non-audit service fee divided by total audit fee, BIG4 is an indicator for big four audit firm, ε is the error term, and the alphas are the coefficients. In relation to Model (2), $EARN = EARN$, the vector of moderators $MOD = (LOSS; NASR)$ and the vector of secondary moderators $SOD = BIG4$ and only affecting one MOD, i.e., NASR. The estimated regression coefficients are based on ordinary least squares (OLS). The p-values, indicating the significance of the regression coefficients, are based on t-values with standard deviations that are adjusted for heteroskedasticity (H) and first-order autocorrelation (AC), see White (1980) and Newey and West (1987). The asterisks ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively. The p-value of the adjusted R² is the standard F-test of the regression, i.e., testing the significance of the specified model variables versus its nested counterpart with no explanatory variables.

Table 4: Estimation of Abnormal Non-Audit Service Ratio to Account for Endogeneity

Panel A: Regression to Explain the Non-Audit Service Ratio by Potential Drivers of Non-Audit Service, Only Coefficients that are at least Weakly Significant are Tabulated

Variable	NASR		p-value (HAC)
LNASR	0.560	***	0.000
SHARE	0.105	**	0.033
SPEC	-0.049	*	0.087
SIZE	-0.009	**	0.034
LIQ	-0.012	*	0.088
Adjusted R ²	0.386	***	0.000
Observations	610		

Panel B: Descriptive Statistics Related to ABNASR, the Estimated Abnormal Non-Audit Service Ratio

	Obs.	Mean	St. dev.	25-percent	Median	75-percent
2003	152	0.000	0.123	-0.076	-0.012	0.078
2004	155	0.000	0.121	-0.091	-0.012	0.071
2005	151	0.000	0.142	-0.098	-0.008	0.083
2006	152	0.000	0.139	-0.083	0.001	0.076
ABNASR	610	0.000	0.131	-0.085	-0.009	0.076

Panel C: Return Regressions with the Abnormal Non-Audit Service Ratio Instead of the Plain Non-Audit Service Ratio

Period – Variable	2003-06 RET	2003 RET	2004-06 RET	
EARN	0.484	-0.018	0.732	**
EARN • LOSS	-1.532 ***	-1.225 ***	-1.788 ***	
EARN • ABNASR	-9.873 ***	-19.182 ***	-4.497	
EARN • BIG4	0.941 ***	1.213 *	0.691 *	
EARN • ABNASR • BIG4	10.188 ***	19.517 ***	4.984	
LOSS	-0.122 **	-0.108	-0.166 ***	
ABNASR	1.035 **	2.032 *	0.483 ***	
BIG4	-0.089	-0.086	-0.050	
ABNASR • BIG4	-0.823	-2.142 *	-0.139	
Adjusted R ²	0.312 ***	0.372 ***	0.296 ***	
Observations	610	152	458	

The regression model in Panel A equals $NASR = \beta_0 \cdot YEAR + \beta_1 \cdot IND + \beta_2 \cdot LNASR + \beta_3 \cdot EARN + \beta_4 \cdot LOSS + \beta_5 \cdot BIG4 + \beta_6 \cdot CHAN + \beta_7 \cdot SHARE + \beta_8 \cdot SPEC + \beta_9 \cdot INTAN + \beta_{10} \cdot DTAX + \beta_{11} \cdot ISSUE + \beta_{12} \cdot GROW + \beta_{13} \cdot BETA + \beta_{14} \cdot SIZE + \beta_{15} \cdot BTM + \beta_{16} \cdot MOM + \beta_{17} \cdot LEV + \beta_{18} \cdot LIQ + \varepsilon$, in which YEAR and IND are vectors of indicator or dummy variables for year and industries, LNASR is the lagged value of NASR, ε is the error term, and betas are coefficients; see Panel B of Table 1 for definitions of other variables. The error term ε is the estimated abnormal non-audit service ratio ABNASR, and its distributional properties are reported in Panel B. Allowing year- and industry-specific intercepts means that the mean abnormal non-audit service ratio is on average zero in each year and industry. The vectors of year- and industry-specific intercepts, i.e., β_0 and β_1 , are not reported; the same is coefficients that are not significant to limit the size of the table. The estimated regression model in Panel C is a version of Model (2): $RET = \alpha_{01} \cdot YEAR + \alpha_{02} \cdot IND + \alpha_1 \cdot EARN + \alpha_{21} \cdot EARN \cdot LOSS + \alpha_{22} \cdot EARN \cdot NASR + \alpha_3 \cdot EARN \cdot BIG4 + \alpha_4 \cdot EARN \cdot NASR \cdot BIG4 + \alpha_{51} \cdot LOSS + \alpha_{52} \cdot NASR + \alpha_6 \cdot BIG4 + \alpha_7 \cdot NASR \cdot BIG4 + \varepsilon$, where YEAR and IND are vectors of indicator or dummy variables for year and industry, ε is the error term, and alphas are the coefficients; see Panel B of Table 1 for the definition of other variables. The vectors of year- and industry-specific intercepts, i.e., α_{01} and α_{02} , are not reported. In relation to Model (2), EARN = EARN, MOD = (LOSS, ABNASR) and SOD = BIG4. The estimated coefficients are based on ordinary least squares. ABNASR has also been estimated by a regression model recognizing that the NASR is truncated between 0 and 1, without significant changes in results. The p-values are based on t-values with standard deviations that are robust for heteroskedasticity (H) or both H and first-order autocorrelation (AC); see White (1980) and Newey and West (1987). The asterisks ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.

Table 5: Estimation of Abnormal Stock Returns, i.e., Risk-Adjusted Stock Returns**Panel A: Regression to Explain Excess Stock Market Return Solely by Ex Ante Risk Factors**

Variable	Predicted sign	RET	p-value (HAC)
BETA	+	0.112 ***	0.001
SIZE	-	-0.009	0.429
BTM	+	0.085 ***	0.006
MOM	-	-0.016	0.721
Adjusted R ²		0.187 ***	0.000
Observations		610	

Panel B: Descriptive Statistics Related to ABRET, the Estimated Abnormal Stock Return

	Obs.	Mean	St. dev.	25-percent	Median	75-percent
2003	152	0.000	0.422	-0.216	-0.049	0.218
2004	155	0.000	0.362	-0.227	-0.016	0.227
2005	151	0.000	0.367	-0.226	-0.024	0.194
2006	152	0.000	0.362	-0.195	-0.006	0.237
ABRET	610	0.000	0.378	-0.221	-0.024	0.219

Panel C: Abnormal Return Regression: Impact of Abnormal Non-Audit Service and Audit Quality

Period – Variable	2003-06 ABRET	2003 ABRET	2004-06 ABRET
EARN	0.476 *	0.357	0.826 ***
EARN • LOSS	-1.031 ***	-0.620 *	-1.418 ***
EARN • ABNASR	-7.557 ***	-12.268 ***	-3.325
EARN • BIG4	0.668 **	0.465	0.428
EARN • ABNASR • BIG4	8.072 ***	13.019 ***	3.677
LOSS	-0.185	-0.174 *	-0.227 ***
ABNASR	0.813 *	2.309 **	0.311
BIG4	-0.051	-0.057	-0.009
ABNASR • BIG4	-0.590	-2.427 **	0.047
Adjusted R ²	0.216 ***	0.408 ***	0.204 ***
Observations	610	152	458

Panel D: Previous Level of Earnings LEARN and Current Change in Earnings DEARN Instead of Current level of Earnings EARN, i.e., $EARN = LEARN + DEARN$

Period – Variable	2003-06 ABRET	2003 ABRET	2004-06 ABRET
LEARN	0.362 ***	0.430 **	0.229
DEARN	1.060 ***	0.941 ***	0.490
DEARN • LOSS	-0.211 **	-0.018	-0.807 ***
DEARN • ABNASR	-0.765	-1.560 **	-4.814 *
DEARN • BIG4	-0.492 ***	-0.503 ***	0.591
DEARN • ABNASR • BIG4	1.063 **	1.913 ***	5.134 *
LOSS	-0.009	0.119	-0.074
ABNASR	0.394	2.036 ***	0.127
BIG4	0.002	-0.006	-0.007
ABNASR • BIG4	-0.177	-2.310 ***	0.248
Adjusted R ²	0.121 ***	0.364 ***	0.104 ***
Observations	610	152	458

The regression model in Panel A is $RET = \beta_0 \cdot YEAR + \beta_1 \cdot IND + \beta_2 \cdot BETA + \beta_3 \cdot SIZE + \beta_4 \cdot BTM + \beta_5 \cdot MOM + \varepsilon$, where YEAR and IND are vectors of indicator or dummy variables for years and industries, ε is the residual term, and the betas are the coefficients. The estimated abnormal stock market return ABRET equals the error term ε , i.e., $ABRET = ERET - \text{predicted } ERET$. The vectors of year- and industry-specific intercepts, i.e., β_0 and β_1 , are not reported. Allowing year- and industry-specific intercept means that the average abnormal return will be zero in each year and for each industry; see Panel B. In Panel C, ABRET is abnormal stock market return and equals the residual from Panel A, and ABNASR is the abnormal non-audit service ratio and equals the residual from Panel A of Table 4. The estimated regression model in Panel C is a version of Model (2): $ABRET = \alpha_{01} \cdot YEAR + \alpha_{02} \cdot IND + \alpha_1 \cdot EARN + \alpha_{21} \cdot EARN \cdot LOSS + \alpha_{22} \cdot EARN \cdot ABNASR + \alpha_3 \cdot EARN \cdot BIG4 + \alpha_4 \cdot EARN \cdot ABNASR \cdot BIG4 + \alpha_{51} \cdot LOSS + \alpha_{52} \cdot ABNASR + \alpha_6 \cdot BIG4 + \alpha_7 \cdot ABNASR \cdot BIG4 + \varepsilon$, where YEAR and IND are vectors of indicator variables for year and industries, ε is the error term, and the alfas are the coefficients. The vectors of intercepts α_{01} and α_{02} are not reported. The estimated coefficients are based on ordinary least squares. The p-values are based on t-values with standard deviations that are robust for heteroskedasticity (H) or H and first-order autocorrelation (AC); see White (1980) and Newey and West (1987). The asterisks ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively. Even though the sign of the coefficients are predicted, the tests are two-sided.

Table 6: Some Further Robustness Tests**Panel A:** No Removal of Extreme Tails – Simple Regression Adjusted for Year and Industry Effects

Period – Variable	2003-06 RET	2003 RET	2004-06 RET
EARN	1.891 ***	2.776 ***	1.045 *
EARN • LOSS	-0.715 ***	-1.158 ***	-0.691 ***
EARN • NASR	-6.483 ***	-11.991 ***	-2.776
EARN • BIG4	-1.205 **	-1.659 **	-0.487
EARN • NASR • BIG4	6.886 ***	12.481 ***	2.918
LOSS	-0.122 *	-0.044	-0.193 ***
NASR	0.671 **	1.150	0.177
BIG4	0.102	0.315	-0.075
NASR • BIG4	-0.581	-1.304	0.113
Adjusted R ²	0.243 ***	0.348 ***	0.231 ***
Observations	630	164	466

Panel B: Coefficient Estimates Based on FGLS, i.e., Adjusted for Heteroskedasticity and First-Order Autocorrelation

Period – Variable	2003-06 ABRET	2003 ABRET	2004-06 ABRET
EARN	0.513 ***	0.509 *	0.507 ***
EARN • LOSS	-1.066 ***	-0.565 ***	-1.480 ***
EARN • ABNASR	-5.895 ***	-10.985 ***	-0.575
EARN • BIG4	0.683 ***	0.350	0.795 ***
EARN • ABNASR • BIG4	6.413 ***	11.879 ***	0.764
LOSS	-0.150 ***	-0.154 ***	-0.195 ***
ABNASR	0.495 **	2.231 ***	-0.089
BIG4	-0.009	-0.056 *	-0.023 *
ABNASR • BIG4	-0.282	-2.362 ***	0.505 ***
Wald	1.03·10⁹ ***	87629.89 ***	10084.20 ***
Observations	585	152	435

Panel C: Analysis of Potential Omitted Variables within OLS: Adding INTAN, CHAN, SHARE, SPEC, BETA, SIZE, BTM, MOM, LEV and LIQ as Potential Moderators of the Earnings Response Coefficient; No Three-Dimensional Interactions Involving These Variables; Stepwise Removal of Insignificant Variables to Reduce Collinearity

Period – Variable	2003-06 ABRET		2003 ABRET		2004-06 ABRET	
EARN	0.282		0.020		0.813	
EARN • LOSS	-0.604	***	-0.384		-1.034	***
EARN • ABNASR	-5.036	**	-6.808	***	-2.830	
EARN • ABNASR • BIG4	6.063	***	8.445	***	3.147	
EARN • SIZE	0.083	***	0.120	**	0.019	
EARN • LEV	0.031	*	0.031		0.008	
EARN • LIQ	0.047	*	0.049		0.065	
LOSS	-0.190	***	-0.074		-0.245	***
ABNASR	0.847	**	1.438	***	0.443	
BETA	0.079	***	0.141	***	0.048	*
SIZE	-0.017	**	-0.026	*	-0.007	
ABNASR • BIG4	-0.663	*	-1.770	***	-0.112	
Adjusted R ²	0.245	***	0.400	***	0.202	***
Observations	610		152		458	

The estimated regressions model in Panel A and B are versions of Model (2): $ABRET = \alpha_{01} \cdot YEAR + \alpha_{02} \cdot IND + \alpha_1 \cdot EARN + \alpha_{21} \cdot EARN \cdot LOSS + \alpha_{22} \cdot EARN \cdot ABNASR + \alpha_3 \cdot EARN \cdot BIG4 + \alpha_4 \cdot EARN \cdot ABNASR \cdot BIG4 + \alpha_{51} \cdot LOSS + \alpha_{52} \cdot ABNASR + \alpha_6 \cdot BIG4 + \alpha_7 \cdot ABNASR \cdot BIG4 + \varepsilon$, where YEAR and IND are vectors of indicator variables for year and industries, ε is the error term, and the alphas are the coefficients. The vectors of intercepts α_{01} and α_{02} are not reported. The estimated regression coefficients in Panel A are based on ordinary least squares with the full sample of 630 firm-year observations. The p-values in the OLS regressions are based on t-values with standard deviations that are adjusted for heteroskedasticity (H) or both H and first-order autocorrelation (AC); see White (1980) and Newey and West (1987). The FGLS regression in Panel B is taking heteroskedasticity and first-order autocorrelations into consideration when estimating the coefficients, instead of through the standard deviations. The number of observations is reduced to 585 in the FGLS regression because of panels with only one time series observations are dropped. If we instead are employing a so called Prais - Winsten regression, allowing for first-order autocorrelation in the coefficient estimates with p-values adjusted for heteroskedasticity, we obtain similar results without and with panel correction in which each panel has its own covariance matrix. In Panel C, the model is expanded by potential variables moderating the earnings response coefficients, in terms of INTAN, CHAN, SHARE, SPEC, BETA, SIZE, BTM, MOM, LEV and LIQ. With extensive use of interactions terms, multicollinearity becomes a problem, leading to somewhat arbitrary loading on collinear variables. To reduce the problem, insignificant variables relative to a level of 10% are removed, except EARN. The asterisks ***, ** and * indicate average statistical significance at the 1%, 5% and 10% level, respectively.