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**Article**

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## ACCOUNTING, CORPORATE GOVERNANCE & BUSINESS ETHICS | RESEARCH ARTICLE

# Non-audit services and auditor independence: Norwegian evidence

Yu (Elli) Zhang<sup>1</sup>, David Hay<sup>1</sup> and Claus Holm<sup>2\*</sup>

**Abstract:** We examine the effect on auditor independence of auditors providing non-audit services in the Norwegian audit market. We report the results of three tests of independence of mind and one test of independence in appearance. These tests find that there is a positive relationship between audit fees and non-audit fees, which does not suggest loss of independence. Further analysis using two-stage least squares shows that audit and non-audit fees are jointly determined, and the results are still not consistent with loss of independence. There is no relationship between the provision of non-audit services and the frequency with which auditors issue modified audit opinions. There is no association between non-audit services and audit tenure. Finally, we examine the relationship between unexpected or excess non-audit fees and cost of capital. There is no relationship. Our findings fail to find any evidence for loss of independence of mind or loss of independence of appearance as a result of providing non-audit services.

**Subjects:** Accounting; Auditing; Business, Management and Accounting

**Keywords:** auditing; non-audit fees; auditor independence; audit opinion; audit tenure; Norway

**JEL classification:** M41; L84; G18

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### PUBLIC INTEREST STATEMENT

Audit regulators suggest that the provision to clients of non-audit services by audit firms may compromise auditor independence. Many studies have investigated the effect the provision of non-audit services has on audit independence. Most of the studies focus primarily on the United States, United Kingdom or Australia. Therefore the purpose of our study is to add more evidence to the research in this stream by investigating the effect of providing non-audit services on auditor independence in Norway. Based on archival data from Norway, we report the results of three tests of independence of mind and one test of independence in appearance. Our findings fail to find any evidence for loss of independence of mind or loss of independence of appearance as a result of providing non-audit services. Hence, the audit regulators concern seems to be unwarranted in this specific country context.

## 1. Introduction

Researchers, regulators, professionals and the public have paid considerable attention to the issue of auditor independence, especially after the commencement of the global financial crisis. There has been a longstanding debate whether the provision to clients of non-audit services by audit firms may compromise auditor independence (e.g. Alexander & Hay, 2013; Wines, 2012; Zerni, 2012). Providing non-audit services increases the economic bond between the auditor and the client, and there is a widespread belief that auditors might sacrifice independence in order to retain clients who are paying large amounts in non-audit fees (DeFond, Raghunandan, & Subramanyam, 2002). Non-audit services have continued to be an important public policy issue in many countries, and stricter requirements are currently being imposed by legislation in Europe. They include a cap on the amount of fees for non-audit services at 70% of the audit fee (Meuwissen, 2014, p. 10).

Many studies have investigated the effect the provision of non-audit services has on audit independence. Most of the studies focus primarily on the United States, United Kingdom or Australia. Therefore the purpose of our study is to add more evidence to the research in this stream by investigating the effect of providing non-audit services on auditor independence in Norway. In Norway financial statement auditing has a similar role as in English-speaking countries. Companies (all private and public limited liability companies) in Norway are required by the Accounting Act to file annual financial statements, and make these statements publicly available. Regulatory changes were made in 2003 and 2005 by the Financial Supervisory Authority of Norway and the Norwegian Ministry of Finance to tighten the rules regarding the types of non-audit services that can be provided by audit firms to audit clients (Eilifsen & Knivsflå, 2013; Hope & Langli, 2010). The Financial Supervisory Authority of Norway criticized audit firms for providing non-audit services to clients, and the changes of 2003 and 2005 reflect concerns regarding the auditor independence issue in Norway and are designed to reinforce auditor independence (Eilifsen & Knivsflå, 2013). Recently there have been further criticisms (Financial Supervisory Authority of Norway, 2011). Thus, although there have been only a very small number of court cases against auditors in Norway—only 12 court cases were related to the audit report and annual statements between 1945 and 2005 (Hope & Langli, 2010)—it is still important for regulators and professionals to address the issue whether providing non-audit services might compromise auditor independence. We provide further evidence regarding findings from prior research in other countries and in the Norwegian setting.

Previous research by Firth (1997, p. 512) noted that international comparisons of the determinants of audit fees are of interest; that there was concern over the provision of other services to the audit client by the auditor; and speculation that lower audit fees are used to procure clients who then give lucrative consultancy business to the accounting firm. He examined whether there was a negative relationship between audit fees and non-audit fees in Norway using data from 1991 and 1992, and found that the relationship was in fact positive. Hope and Langli (2010, p. 574) examined the issue of auditor independence in the Norwegian environment because it is a low litigation environment for audit firms but where the overall level of investor protection is high. Holding other factors constant, reducing the risk of lawsuits for negligence and misconduct should reduce the constraints for auditors to impair their independence in return for greater fees. They found no evidence that auditors who receive higher non-audit fees were less likely to issue modified opinions. Eilifsen and Knivsflå (2013, p. 87) added that in recent years the issue has been of increased relevance after the Norwegian Financial Supervisory Authority (FSA), publicly disclosed extensive cases of inappropriate auditor-provided NAS, proposed new and more restrictive regulations governing the provision of NAS and heightened investor concerns regarding auditor independence. Their tests examined earnings response coefficients at a time when there had been publicity about auditors breaching independence rules, and found evidence that investors were concerned about NAS provided by auditors. These three previous studies suggest that evidence from Norway about whether auditors lose their independence is generally relevant, and currently topical. Our study presents more recent evidence on the effect on auditor independence of providing non-audit services, and extends the analysis, compared to previous studies, by undertaking a wider range of tests for potential effects on non-audit services on auditor behavior or on the financial markets.

This study develops from Hay, Knechel, and Li's (2006a) study. We report the results of three approaches to testing independence of mind and one approach to testing independence in appearance. The first three ways to investigate potential loss of audit independence as a result of providing non-audit services to audit clients we describe as "the loss-leader issue," "the soft audit opinion issue," and "the tame auditor issue." The fourth approach examines whether non-audit services lead to a higher cost of capital. The first question examines the relationship between audit fees and non-audit fees over the three study years from 2008 to 2010. Do auditors reduce the level of audit fees in the presence of higher non-audit services? We examine this question using two-stage least squares as well as OLS. The second research question we address is whether auditors are less likely to issue modified reports when they receive a high level of non-audit fees. It is argued that auditors who are engaging in providing non-audit services might face economic losses if they are dismissed after issuing modified audit opinions, and thus might be less likely to issue modified audit reports to clients who are paying high non-audit fees (Barkess & Simnett, 1994). The third research question investigates whether audit clients are less likely to switch to new auditors if they pay a high level of non-audit fees. It is argued that if auditors lose independence when they provide non-audit services, then this is more likely to result in a longer tenure for the auditor with its client because there is less likely to be a dispute leading the auditor to resign. These tests do not show any evidence of loss of independence. The results of regression models show that there is a positive relationship between audit fees and non-audit fees. Analysis using two-stage least squares shows that audit and non-audit fees are jointly determined, these results also being not consistent with loss of independence. There is no significant relationship between non-audit services and either the frequency with which auditors issue qualified or modified audit reports or the length of auditor tenure. Our fourth test follows prior studies (Amir, Guan, & Livne, 2010; Hope, Kang, Thomas, & Yoo, 2009) examining the association between auditor independence and cost of capital using a model of the relationship between unexpected or excess audit fees and cost of debt. We do not find any relationship. Thus, all four of the approaches to testing fail to find any evidence to support loss of independence, neither independence of mind nor independence of appearance.

The study complements and further develops from earlier Norway studies by Firth (1997), Hope and Langli (2010), and Eilifsen and Knivsflå (2013). We take advantage of the natural experiment provided by the recent change in regulation and publicity about auditor independence. We also extend a wider range of tests of this issue to a country covered by a Scandinavian legal system. It is generally useful to examine auditor independence and regulatory change in one of many small developed countries. In addition, changes made in the European Union will also result in changes in Norway, and it is therefore be useful to document the effect of auditors providing non-audit services on their independence prior to making further changes.

## 2. Background

In this section, we discuss reasons to study the effect on auditor independence of the provision of non-audit services in Norway. In 1984, the Eighth Council Directive, intended to harmonize the regulation of auditors in the European Union, was adopted by the European Commission. The Directive delegates authority to Member States on the subject of auditor independence (Stevenson, 2002). In order to see the effects after the adoption of the Eighth Directive, the European Commission conducted a comprehensive study into statutory auditors in the European Union in terms of the auditors' role, position, and liability. All 15 European Union Member States plus Norway were included in the study,<sup>1</sup> and the findings were published in a 1996 Green Paper. The Green Paper discusses issues and concerns relating to auditors. The Green Paper (1996) clarifies that both independence of mind and independence in appearance need to be addressed when dealing with the subject of auditor independence. Although the provision of non-audit services has a debatable influence on auditor independence, there is no European Union-wide ban preventing auditors from providing non-audit services to audit clients yet (Green Paper, 2010). A number of EU countries revised their specific independence requirements based on the recommendation on the statutory auditors' independence in the EU (EC, 2002) and the subsequent changes in eight directive on statutory audits (EC, 2006). This is also consistent with the regulatory changes in Norway. Auditor independence continues to be

an important issue in the European Union after the global financial crisis, and further restrictions on NAS are currently being implemented (Meuwissen, 2014).

Norway participates in the EEA Agreement and implements the EU Law Directives although it is not a Member State of the European Union (Eilifsen, 1998). Moreover, the country has a similar auditing environment to that of other Western countries, where a generally supportive climate is provided for international harmonisation efforts in the auditing area (Eilifsen, 1998). Norway is also an interesting setting for research because of its relative prosperity, and innovative requirements for companies to include women board members. The Norwegian Accounting Act requires all private and public limited liability companies to file annual financial statements and these statements must be made publicly available. Also, the Act requires firms to disclose audit fees and non-audit fees separately in annual reports since 1990 (Hope & Langli, 2010). In addition, Norway is included in the Scandinavian civil law family (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998).

Comparative law identifies the Scandinavian legal family of Denmark, Norway, and Sweden as having a distinct Roman law origin as compared to the French and German civil code families and exhibiting traits from both civil law and common law traditions (Beck & Levine, 2005; Berkowitz, Pistor, & Richard, 2003; David & Brierley, 1985). Studying the auditor independence issue in Norway enables us to show whether prior research findings are applicable to this legal system and therefore also extend prior research on the interface between the role of the accounting profession and the law in the Scandinavian countries (see also Holm, 2014).

In 2003 and 2005 the Financial Supervisory Authority of Norway (FSA) and the Norwegian Ministry of Finance made regulatory changes to tighten the rules regarding the types of non-audit services that can be provided by an audit firm to its clients.<sup>2</sup> FSA undertook an investigation of the five largest Norwegian audit firms during the year 2002 and the first half of 2003 for possible breaches of regulations concerning the provision of non-audit services to audit clients (Eilifsen & Knivsflå, 2013). The investigation results criticised audit firms for providing non-audit services which endangered auditor objectivity and independence (Eilifsen & Knivsflå, 2013). Thus, the FSA proposed the Ministry of Finance introduce more detailed legal proscriptions on provision of non-audit services in June 2003 (Eilifsen & Knivsflå, 2013). The new regulation prohibits audit firms from providing management functions to audit clients or acting as principals for their clients (Hope & Langli, 2010). The nature of the regulation parallels specific recommendations provided by the European Commission in relation to the statutory auditors' independence in the EU (EC, 2002).

However, a limited number of studies on auditor independence and the effect of non-audit services has focused on Norway. Three research studies (Hope & Langli, 2009) investigate the relationship between the provision of non-audit services and auditor independence in Norway. Thus, our research, with a study period from 2008 to 2010, extends beyond the previous studies. A wider range of tests than those in earlier papers are used. These include a two-stage least squares examination as well as OLS examination of the issue of the relationship between audit fees and non-audit fees; as well as the tests of audit opinions and audit tenure, using an improved measure; and an examination of the relationship between non-audit services and the cost of debt. Our paper provides further evidence concerning the effect on auditor independence of the provision of non-audit services after the regulatory changes.

### 3. Literature review and hypothesis development

#### 3.1. The relationship between audit and non-audit fees

The relationship between audit fees and non-audit fees has been examined extensively. There are two theoretical arguments that imply a negative relationship exists between audit fees and non-audit fees. The first is the “loss leader” argument, that a lower-priced audit is used to entice companies to switch to, or stay with, the auditor, so that the auditor can obtain non-audit service fees. This might create a threat to auditor independence. The other argument is known as the “knowledge

spillover” argument. The provision of both audit and non-audit services to clients would result in knowledge spillovers such that reduction of audit services cost may be achieved. The negative relationship in this case does not necessarily undermine auditor independence. Overall, while the body research has generally found no evidence to support a loss of independence when non-audit services are provided (Francis, 2006), there are some recent studies suggesting that non-audit services are indeed associated with lower financial reporting quality (Blay & Geiger, 2012; Cahan, Emanuel, Hay, & Wong, 2008; Krishnan, Su, & Zhang, 2011; Markelevich & Rosner, 2013).

Prior research has often found a positive relationship between audit fees and non-audit fees. Simunic (1984), Palmrose (1986), Barkess and Simnett (1994), Ezzamel, Gwilliam, and Holland (1996) and a study of Norwegian data by Firth (1997) have shown a positive relationship exists between audit fees and non-audit fees. On the contrary, Abdel-Khalik (1990) and O’Keefe, Simunic, and Stein (1994) have documented no relationship between audit fees and non-audit fees. Whisenant, Sankaraguruswamy, and Raghunandan (2003) question the single-equation estimations of fee models, and use a simultaneous specification of the fee model to re-examine the relationship between audit fees and non-audit fees. A positive relationship between audit fees and non-audit fees is found when the OLS method is used, but Whisenant et al. discover that there is no positive relationship when a simultaneous specification of the fee model applying two-stage least squares is used, suggesting that audit fees and non-audit fees are simultaneously determined. Hay et al. (2006a) also find no relationship between audit fees and non-audit fees when the two-stage least squares approach is used. In contrast, Antle, Gordon, Narayanamoorthy, and Zhou (2006) examine a system of simultaneous equations for audit fees, non-audit fees, and abnormal accruals using both UK and US data, and find a positive relationship between audit fees and non-audit fees in both OLS and jointly determined models. More recently, Krishnan and Yu (2011) extend the analysis by Whisenant et al. (2003) and find evidence of a negative relationship between audit fees and non-audit fees consistent with knowledge spillovers. In sum, many studies have shown empirical evidence supporting a positive relationship between audit fees and non-audit fees, and there is very little evidence for a negative relationship, although there is still some uncertainty. This review of prior studies leads to our first hypothesis, examining the loss-leader issue but predicting the opposite of the loss-leader argument:

H1: there is a positive relationship between audit and non-audit fees.

### **3.2. Non-audit services and audit opinions**

The empirical results of studies examining non-audit services and audit opinions are also mixed. On the one hand, Craswell (1999), Barkess and Simnett (1994), DeFond et al. (2002), and Hope and Langli (2010) found no relationship between the level of non-audit services provision and the auditor’s opinion. In particular, DeFond et al. (2002) found the provision of non-audit services does not affect the propensity to issue a going concern opinion. However, on the other hand, Wines (1994), Sharma and Sidhu (2001), and Firth (2002) found a negative relationship between non-audit fees and auditor’s opinion. This negative relationship implies that the level of non-audit fees was associated with a lower incidence of audit qualifications or modifications. However some studies did not control for circumstances where companies were more likely to merit a qualified opinion (e.g. Wines, 1994). Sharma and Sidhu (2001) control for financial distress, mitigating factors, client size and auditor reputation. The results indicate that a higher proportion of non-audit fees is associated with a lesser propensity for auditors to issue a going concern qualified opinion, implying that the provision of high levels of non-audit services by auditors compromises auditor independence. Craswell, Stokes, and Laughton (2002) investigate the relationship between qualified opinions and fee dependence, and find that “fee dependence does not affect propensity to issue unqualified opinions.” More recently, a study by Li (2009) shows that higher non-audit fees are associated with greater (not lesser) propensity to issue going concern opinions. Hope and Langli (2010) investigate the relationship by specifically studying private companies in Norway. They use an abnormal fee model to test the relationship between the level of non-audit fees and the auditor’s opinions. The results of their study suggest that there is no evidence that auditors receiving a high level of abnormal fees are less likely



to issue going concern modifications. Their study examines a different setting, namely private companies, from the present study and uses data from an earlier period.

Taken together, there is some evidence that the provision of a large quantity of non-audit services is associated with a lower incidence of audit qualification or modification implying undermined auditor independence (the soft audit opinion hypothesis). But the results in this line of research are mixed, and thus further investigation of the relationship between non-audit services and auditor's opinion is needed. Hence, our second hypothesis tests whether there is loss of independence:

H2: there is a negative relationship between the level of non-audit fees and the frequency of audit qualifications or modifications.

### **3.3. Non-audit fees and auditor tenure**

A high level of non-audit fees might lead to auditors losing their independence and as a result there might be fewer disputes and less frequent auditor switches. If this is the case, it is expected that there is a positive relationship between non-audit fees and auditor tenure, which implies that a high level of non-audit fees would be associated with longer auditor tenure (Hay et al., 2006a). Barkess and Simnett (1994) and Hay et al. (2006a) found no relationship between the level of non-audit services and auditor tenure. However, the argument for a positive relationship (the tame auditor issue) is worthy of investigation. Thus, our third hypothesis is whether a loss of independence is evident through longer tenure when NAS occurs:

H3: there is a positive relationship between the level of non-audit services and auditor tenure.

### **3.4. Unexpected or excess fees and cost of debt**

Following prior studies examining the association between auditor independence and cost of capital (Amir et al., 2010; Hope et al., 2009) we predict a relationship between unexpected or excess fees and cost of capital. In line with the arguments provided in prior studies (Dhaliwal, Gleason, Heitzman, & Melendrez, 2008; Hope et al., 2009) as well as the theoretical proposition by Amir et al. (2010) we propose that the cost of capital is higher when the auditor is less independent. A higher cost of capital might occur when there are higher unexpected fees as a result of reduced independence in appearance. Thus our fourth hypothesis is:

H4: there is a positive relationship between the level of unexpected or excess fees and cost of debt

## **4. Sample selection**

Our study is based on Norwegian companies with financial data available on Compustat Global database for the years 2008–2010. Data from this period was selected because it is after the recent reforms and public concern about auditor independence, and because there is already evidence from published studies about earlier periods. We first find all Norwegian companies available on Compustat Global. Annual reports from 2008 to 2010 are collected from companies' websites, using either the English or Norwegian language version of the report. The data consists of 138 companies in 2008, 139 companies in 2009, and 138 companies in 2010. Audit fees data, non-audit fees data, and information about auditor, auditor opinion, and number of subsidiaries of the sample firms are extracted manually from the annual reports. The practice for international audit fee studies is to focus on more than one years' observations. As in our study a three-year period has been common. Some companies in the sample report their financial data in USD or EUR. These data are translated into Norwegian Kroner (NOK) using annual exchange rates reported by the Central Bank of Norway over the sample period.

Three main reasons can be provided for the choice of time period and length of this. The first is related to the timing after the introduction of new regulation, the second is the timing related to the worldwide financial crises and the third is related to the access of audit fee data. While the period examined includes the global financial crisis, the crisis was not particularly severe in Norway.

According to annual progress reports published by the Statistics Norway bureau (Statistisk sentralbyrå) the year 2008 marked a significant change after four years of strong growth in the Norwegian economy (Statistisk sentralbyrå, 2009, p. 3). In retrospect, the 2011 progress report indicates that an active use of monetary and financial instruments in Norway dampened the repercussions of the financial crises taking full effect from the second half of 2008. Even though 2009 led to a drop in GNP, the period 2008–2010 experienced a growth in total GNP (and even stronger for business services such as audit and consulting) and the economic setback was thus less harsh on the Norwegian economy than seen in comparable countries (Statistisk sentralbyrå, 2011, p. 3).

Most Norwegian companies operate in mining (i.e. oil and gas), manufacturing and transportation, communication, electric, gas, and sanitary services industries. Prior research generally controls for companies operating in mining and financial industries due to their specific industry characteristics. However, since there is no financial company in our selected sample, we set only mining companies as dummy variables in order to control for industry effects in the model specification process.

## 5. Research design

In this section, we describe the multivariate regression models employed in this study to examine the relationship between the provision of non-audit services and auditor independence in the three ways discussed above.

### 5.1. Audit fees and non-audit fees

Hypothesis 1 predicts that audit fees are positively associated with non-audit fees. To test this hypothesis, we regress audit fees on the variable of interest ‘non-audit fees’ and a set of control variables. This audit fee model is estimated for each year. In the regression model, we control for client size, risk, and complexity using control variables based on previous studies (Hay, Knechel, & Wong, 2006b). The cross-sectional regression model to test hypothesis 1 is summarized as follows:

$$\begin{aligned} \text{Ln}(\text{AF}) = & \alpha + \beta_1 \text{Ln}(\text{NAF}) + \beta_2 \text{Ln}(\text{TA}) + \beta_3 \text{INVREC} + \beta_4 \text{SQRTSUB} + \beta_5 \text{ROA} \\ & + \beta_6 \text{LOSS} + \beta_7 \frac{\text{TD}}{\text{TA}} + \beta_8 \frac{\text{CA}}{\text{CL}} + \beta_9 \text{BIG4} + \beta_{10} \text{OPINION} + \varepsilon \end{aligned} \quad (1)$$

where Ln(AF) = natural log of audit fees; Ln(NAF) = natural log of non-audit fees; Ln(TA) = natural log of total assets; INVREC = ratio of the sum of inventory and accounts receivable to total assets; SQRTSUB = square root of the number of subsidiaries; ROA = ratio of EBIT to total assets; LOSS = 1 if ROA is less than zero and zero otherwise; TD/TA = ratio of total debt to total assets; CA/CL = ratio of current assets to current liabilities; BIG 4 = 1 if a client company is audited by Big Four audit firm and zero otherwise; and OPINION = 1 if a client company received a qualified or modified report and zero otherwise.

### 5.2. Non-audit services and auditor’s opinion

The second hypothesis predicts that there is a negative relationship between the level of non-audit fees and the frequency of audit qualifications or modifications. Prior research uses a logistic regression model to examine similar research questions (Craswell, 1999; DeFond et al., 2002; Sharma & Sidhu, 2001; Wines, 1994). We estimate the following cross-sectional logistic model for each year:

$$\begin{aligned} \text{OPINION} = & \alpha + \beta_1 \frac{\text{NAF}}{(\text{NAF} + \text{AF})} + \beta_2 \text{FEEDEP} + \beta_3 \text{Ln}(\text{TA}) + \beta_4 \text{INVREC} + \beta_5 \text{ROA} + \beta_6 \text{LOSS} \\ & + \beta_7 \frac{\text{TD}}{\text{TA}} + \beta_8 \text{BIG4} + \beta_9 \text{MINING} + \beta_{10} \text{SQRTSUB} + \varepsilon \end{aligned} \quad (2)$$

where variables are defined as before except for: NAF/(NAF + AF) = the ratio of non-audit fees to non-audit fees plus audit fees; FEEDEP = fee dependence is measured as the sum of a specific client’s audit fees and non-audit fee payment divided by total audit fees and non-audit fees of the auditor; and MINING = 1 if a company operates in the mining industry, zero otherwise.



### 5.3. Non-audit fees and auditor tenure

Hypothesis 3 predicts that there is a positive relationship between the level of non-audit services and auditor tenure if auditors lose independence. To test this hypothesis, we follow two different methods used in Hay et al. (2006a).

The first method is a cross-sectional logistic model, using short auditor tenure as the dependent variable.

$$\begin{aligned} \text{SHORT TENURE (0, 1)} = & \alpha + \beta_1 \frac{\text{NAF}}{(\text{NAF} + \text{AF})} + \beta_2 \text{OPINION} + \beta_3 \text{Ln(TA)} + \beta_4 \text{INVREC} + \beta_5 \text{ROA} \\ & + \beta_6 \text{LOSS} + \beta_7 \text{ROA} + \beta_8 \frac{\text{TD}}{\text{TA}} + \beta_9 \frac{\text{CA}}{\text{CL}} + \beta_{10} \text{SQRTSUB} + \beta_{11} \text{MINING} \\ & + \beta_{12} \text{BIG4} + \beta_{13} 2009 + \beta_{14} 2010 + \varepsilon \end{aligned} \quad (3)$$

where variables are defined as before except: SHORT TENURE = 1 if an auditor's tenure is three years or less, 0 if four years or more.

The second regression model tests whether short auditor tenure is related to non-audit fees when client size, industry, Big Four auditor, and audit fees are controlled. The non-audit fees model is summarized as below (variables are defined as before):

$$\begin{aligned} \text{Ln(NAF)} = & \alpha + \beta_1 \text{SHORT TENURE} + \beta_2 \text{Ln(TA)} + \beta_3 \text{Ln(AF)} + \beta_4 \text{INVREC} + \beta_5 \text{SQRTSUB} \\ & + \beta_6 \text{ROA} + \beta_7 \text{LOSS} + \beta_8 \frac{\text{TD}}{\text{TA}} + \beta_9 \frac{\text{CA}}{\text{CL}} + \beta_{10} \text{OPINION} + \beta_{11} \text{BIG4} \\ & + \beta_{12} \text{MINING} + \beta_{13} 2009 + \beta_{14} 2010 + \varepsilon \end{aligned} \quad (4)$$

### 5.4. Unexpected or excess fees and cost of debt

Hypothesis 4 predicts that there is a positive relationship between the level of unexpected or excess fees and cost of debt. To test this hypothesis we follow an established two-step procedure (e.g. Amir et al., 2010; Hope et al., 2009). The first step is to identify excess fees by applying the regression residuals from the fee model specification.

For this test, Amir et al. (2010) measured auditor independence in two ways. First as the ratio of audit fees to total fees (AF/TF) where a higher level implies lower economic bonding and a higher unexpected level (measured using regression residuals) implies greater independence. Second, auditor independence is measured in a regression model using the logarithm of total fees (Ln(TF)), where higher unexpected level (using regression residuals) implies reduced independence. The latter measure was also applied in the study by Hope et al. (2009, 2005) which in a cross-country analysis found that the positive relation between cost of capital and excess auditor remuneration (lack of independence) is stronger in countries that have stronger investor protection environments (including Norway). In a separate analysis of UK and US data Hope et al. (2009) also considered separate models using unexpected AF and unexpected NAF as alternatives to unexpected TF. We also use the following model for FEE (representing the alternative measures of non-audit fees) in order to identify excess fees (the  $\varepsilon$  measure).

$$\begin{aligned} \text{FEE} = & \alpha + \beta_1 \text{Ln(TA)} + \beta_2 \text{INVREC} + \beta_3 \text{SQRTSUB} + \beta_4 \text{ROA} + \beta_5 \text{LOSS} + \beta_6 \text{TDTA} + \beta_7 \frac{\text{CA}}{\text{CL}} \\ & + \beta_8 \text{BIG} + \beta_9 \text{OPINION} + \text{YEAR dummies} + \text{INDUSTRY dummies} + \varepsilon \end{aligned} \quad (5)$$

where FEE is proxied by alternative fee specifications namely, AF/TF, Ln(AF), Ln(TF), and Ln (NAF).

The second step is to consider a cost of debt model. Prior studies examining cost of capital in listed companies have applied different measures such as applying the spread between company bond

and treasury bonds (Dhaliwal et al., 2008), using a valuation formula to impute the cost of capital (Gietzmann & Ireland, 2005; Hope et al., 2009) and using the ratio of annual interest expense to the sum of average total debt (Francis, Khurana, & Pereira, 2005; Gray, Koh, & Tong, 2009; Kim, Simunic, Stein, & YI, 2011). We apply the latter simple measure for cost of debt which in the Norwegian context also makes sense because of the relative low level of corporate bond financing of listed companies in Norway (Sundheim & Hårstad, 2012). Consistent with the above-mentioned prior studies, we control for additional variables with possible influence on the cost of debt.

$$\begin{aligned} \text{COD} = & \alpha + \beta_1 \text{EXCESSFEE} + \beta_2 \text{Ln(TA)} + \beta_3 \text{LEV} + \beta_4 \text{ROA} + \beta_5 \text{IntCov} + \beta_6 \sigma(\text{NIBE}) \\ & + \beta_7 \text{TANGIBLEtoTA} + \beta_8 \text{SALESGROWTH} + \beta_9 \text{NEG EQUITY} + \epsilon \end{aligned} \quad (6)$$

where COD = Cost of debt is measured as interest expense divided by the average total debt; EXCESSFEE = Excess auditor remuneration computed as the residual from Equation (5); Ln(TA) = Size (the natural log of total assets); LEV = Leverage (ratio of total debt to total assets); ROA = ROA (return on assets); IntCov = Interest Cover (the ratio of operating income to interest expense);  $\sigma(\text{NIBE})$  = Standard deviation of net income before extraordinary items, scaled by average assets, over the past five years; TANGIBLEtoTA = Tangible assets to total assets; SALESGROWTH = Growth in sales on most recent year; NEGEQUITY = Dummy variable equal to 1 if equity is zero, 0 otherwise.

## 6. Results

### 6.1. Descriptive statistics

Panel A of Table 1 summarizes descriptive statistics. The mean audit fees paid by the selected companies are NOK 4,544,014 in 2008, NOK 4,829,411 in 2009, and NOK 4,457,652 in 2010. The mean values of audit-related non-audit fees are NOK 486,786 in 2008, NOK 911,798 in 2009, and NOK 462,355 in 2010, and mean other non-audit fees are NOK 1,585,812 in 2008, NOK 1,457,637 in 2009, and NOK 1,651,395 in 2010. These two categories (audit-related non-audit fees and other non-audit fees) are combined as non-audit fees in the testing that follows. The ratio of non-audit fees to the sum of non-audit fees plus audit fees declines over the period from 51.9 percent in 2008 to 48.9 percent in 2009 and 43.1 percent in 2010. The mean total assets of the firms is NOK 18,800 million in 2008, NOK 19,200 million in 2009, and NOK 20,700 million in 2010. Based on these statistics, the Norwegian sample companies pay substantially lower amounts for non-audit services than for audit services. This could be the result of the regulatory changes made in 2003 and 2005 in Norway that tightened the number of non-audit services that could be provided to audit clients. Moreover, these sample companies are smaller (as measured by total assets) than companies in the United Kingdom and United States. The mean values for ROA ratio are  $-0.0227$  in 2008,  $-0.0237$  in 2009, and  $0.0050$  in 2010 and the negative ROA ratios may reflect some financial risks of the firms.

Panel B of Table 1 shows information about indicator variables used in this study. Very few companies in the sample received modified or qualified audit opinions over the sample period—eight in each of the three years. All of these are audit modifications for going-concern issues. Secondly, Panel B shows that over 94% of sample firms are clients of the Big Four. Comparatively few companies have short audit tenure (of three years or less, although the trend is toward more switches. There were nine companies with SHORT TENURE in 2008, 17 in 2009, and 26 in 2010.

### 6.2. Results for main tests

#### 6.2.1. Hypothesis 1: audit fees and non-audit fees

The results of Model 1, which investigates the relationship between audit fees and non-audit fees over the sample period 2008–2010, are reported in Table 2. Non-audit fees are statistically significantly and positively associated with audit fees at the one percent level, which is consistent with prior studies and with Hypothesis 1. The regression model has an  $R^2$  greater than 72 percent.<sup>3</sup> A clustered analysis is used for the pooled data. In addition, separate models for each of the years

**Table 1. Descriptive statistics**

**Panel A: Continuous variables**

|                                | Year | Obs | Mean       | Std. Dev.  | Median    | Min     | Max         |
|--------------------------------|------|-----|------------|------------|-----------|---------|-------------|
| Audit fees (NOK'000)           | 2008 | 138 | 4,544.014  | 9,149.672  | 1,463.000 | 95.000  | 60,300.000  |
|                                | 2009 | 139 | 4,829.411  | 8,954.649  | 1,866.000 | 75.000  | 61,300.000  |
|                                | 2010 | 138 | 4,457.652  | 8,170.349  | 1,644.000 | 133.539 | 64,500.000  |
| Audit-related non-audit fees   | 2008 | 138 | 486.786    | 1,145.020  | 60.499    | 0.000   | 8,900.000   |
|                                | 2009 | 139 | 911.798    | 4,576.545  | 91.000    | 0.000   | 52,332.840  |
|                                | 2010 | 138 | 462.355    | 1,500.158  | 82.500    | 0.000   | 14,200.000  |
| Other non-audit fees           | 2008 | 138 | 1,585.812  | 2,709.266  | 633.000   | 0.000   | 17,000.000  |
|                                | 2009 | 139 | 1,457.637  | 2,290.494  | 682.000   | 0.000   | 12,000.000  |
|                                | 2010 | 138 | 1,651.395  | 4,429.401  | 588.197   | 0.000   | 46,000.000  |
| Total audit and non-audit fees | 2008 | 138 | 6,616.612  | 12,099.810 | 2,278.492 | 121.000 | 77,700.000  |
|                                | 2009 | 139 | 7,198.846  | 13,203.730 | 2,691.000 | 203.000 | 81,600.000  |
|                                | 2010 | 138 | 6,644.901  | 12,621.380 | 2,637.296 | 177.000 | 89,000      |
| FEEDEP                         | 2008 | 138 | 0.047      | 0.103      | 0.011     | 0.000   | 0.654       |
|                                | 2009 | 139 | 0.047      | 0.113      | 0.012     | 0.001   | 1.000       |
|                                | 2010 | 138 | 0.047      | 0.112      | 0.012     | 0.001   | 1.000       |
| NAF/(NAF+AF)                   | 2008 | 138 | 0.519      | 0.620      | 0.330     | 0.000   | 4.068       |
|                                | 2009 | 139 | 0.489      | 1.126      | 0.276     | 0.000   | 12.440      |
|                                | 2010 | 138 | 0.431      | 0.542      | 0.284     | 0.000   | 4.019685    |
| Total assets (NOK'000)         | 2008 | 138 | 18,800,000 | 54,900,000 | 4,404,893 | 11,432  | 578,000,000 |
|                                | 2009 | 139 | 19,200,000 | 54,300,000 | 4,304,910 | 10,186  | 563,000,000 |
|                                | 2010 | 138 | 20,700,000 | 60,800,000 | 4,488,144 | 20,642  | 643,000,000 |
| Ln(TA)                         | 2008 | 138 | 15.067     | 2.049      | 15.298    | 9.344   | 20.176      |
|                                | 2009 | 139 | 15.093     | 2.026      | 15.275    | 9.229   | 20.149      |
|                                | 2010 | 138 | 15.183     | 1.999      | 15.317    | 9.935   | 20.282      |
| INVREC                         | 2008 | 138 | 0.225      | 0.186      | 0.154     | 0.000   | 0.682       |
|                                | 2009 | 139 | 0.215      | 0.175      | 0.153     | 0.001   | 0.676       |
|                                | 2010 | 138 | 0.217      | 0.181      | 0.151     | 0.000   | 0.668       |
| ROA                            | 2008 | 138 | -0.044     | 0.315      | 0.029     | -2.223  | 0.337       |
|                                | 2009 | 139 | -0.033     | 0.263      | 0.017     | -1.955  | 0.334       |
|                                | 2010 | 138 | -0.004     | 0.186      | 0.021     | -1.196  | 0.540       |
| TD/TA                          | 2008 | 138 | 0.295      | 0.246      | 0.264     | 0.000   | 0.848       |
|                                | 2009 | 139 | 0.367      | 1.077      | 0.251     | 0.000   | 12.670      |
|                                | 2010 | 138 | 0.267      | 0.235      | 0.216     | 0.000   | 0.819       |
| CA/CL                          | 2008 | 138 | 2.072      | 2.927      | 1.406     | 0.065   | 29.711      |
|                                | 2009 | 139 | 2.454      | 3.650      | 1.593     | 0.060   | 26.014      |
|                                | 2010 | 138 | 2.340      | 5.582      | 1.456     | 0.061   | 65.390      |
| SQRTSUB                        | 2008 | 138 | 3.524      | 2.419      | 3.000     | 0.000   | 15.780      |
|                                | 2009 | 139 | 3.545      | 2.407      | 3.000     | 0.000   | 16.553      |
|                                | 2010 | 138 | 3.576      | 2.416      | 3.162     | 0.000   | 16.553      |

(Continued)

**Table 1. (Continued)**

**Panel B: Indicator variables**

|                                      | 2008 |      | 2009 |      | 2010 |      |
|--------------------------------------|------|------|------|------|------|------|
|                                      | No.  | %    | No.  | %    | No.  | %    |
| Audit opinions-qualified or modified | 8    | 5.1  | 8    | 5.8  | 8    | 5.1  |
| Big Four audits                      | 131  | 94.9 | 131  | 94.2 | 130  | 94.2 |
| SHORT TENURE (3 years or less)       | 9    | 8.4  | 17   | 13.5 | 26   | 19.4 |
| Mining companies                     | 33   | 23.9 | 32   | 23.0 | 31   | 22.5 |
| Mining companies                     | 33   | 23.9 | 32   | 23.0 | 31   | 22.5 |

Notes: Variable definitions: FEEDEP = sum of client's audit fees divided by total audit fees of audit firm; NAF/(AF + NAF) = ratio of non-audit fees to total audit fees and non-audit fees. Ln(TA) = natural log of total assets; INVREC = ratio of the sum of inventory and accounts receivable to total assets; ROA = ratio of EBIT to total assets; TD/TA = ratio of total debt to total assets; CA/CL = ratio of current assets to current liabilities; SQRTSUB = square root of the number of subsidiaries. Exchange rates: USD 1 = NOK 5.64 in 2008, NOK 6.28 in 2009, and NOK 6.05 in 2010.

**Table 2. OLS model of audit fees, non-audit fees, and control variables**

**Pooled model**

$$\begin{aligned} \text{Ln}(\text{AF}) = & \alpha + \beta_1 \times \text{Ln}(\text{NAF}) + \beta_2 \times \text{Ln}(\text{TA}) + \beta_3 \times \text{INVREC} + \beta_4 \times \text{SQRTSUB} + \beta_5 \times \text{ROA} \\ & + \beta_6 \times \text{LOSS} + \beta_7 \times \frac{\text{TD}}{\text{TA}} + \beta_8 \times \frac{\text{CA}}{\text{CL}} + \beta_9 \times \text{BIG4} + \beta_{10} \times \text{OPINION} + \varepsilon \end{aligned}$$

| Independent variables              | Coef.    | t-statistic | p-value | VIF  |
|------------------------------------|----------|-------------|---------|------|
| Ln(NAF)                            | 0.159*** | 4.64        | 0.000   | 1.40 |
| Ln(TA)                             | 0.355*** | 8.77        | 0.000   | 2.04 |
| INVREC                             | 1.366*** | 4.41        | 0.000   | 1.21 |
| ROA                                | -0.317   | -1.09       | 0.276   | 1.44 |
| LOSS                               | 0.000*** | 6.96        | 0.000   | 1.03 |
| TD/TA                              | -0.021   | -0.65       | 0.515   | 1.05 |
| CA/CL                              | -0.012** | -2.00       | 0.047   | 1.10 |
| SQRTSUB                            | 0.146*** | 5.55        | 0.000   | 1.52 |
| BIG 4                              | -0.267   | -1.25       | 0.215   | 1.12 |
| OPINION                            | 0.198    | 0.84        | 0.402   | 1.14 |
| Constant                           | 0.557    | 0.97        | 0.335   |      |
| R <sup>2</sup>                     | 0.726    |             |         |      |
| Adjusted R <sup>2</sup> (see note) | 0.708    |             |         |      |
| F-Statistic                        | 38.59*** |             | 0.000   |      |
| Number of observations             | 415      |             |         |      |

Notes: Table 2 presents the results from the OLS regression model which investigates the relationship between audit fees and non-audit fees. The sample period is from 2008 to 2010.

Ln(AF): natural log of audit fees (dependent variable); Ln(NAF): natural log of non-audit fees; Ln(TA): natural log of total assets; INVREC: ratio of the sum of inventory and accounts receivable to total assets; ROA: ratio of EBIT to total assets; LOSS: 1 if company's ROA is less than zero, otherwise zero; TD/TA: ratio of total debt to total assets; CA/CL: ratio of current assets to current liabilities; SQRTSUB: square root of the number of subsidiaries; BIG 4: 1 if company is audited by a Big Four audit firm, otherwise zero; OPINION: 1 if firms received a qualified or modified report, otherwise zero.

t-statistics are computed using robust standard errors.

Adjusted R<sup>2</sup> is not computed by Stata because it is not strictly relevant when robust standard errors are used, but is reported for comparability.

VIF represents variance inflation factor, which is used to detect multicollinearity problems. If a VIF value is greater than 10, it indicates multicollinearity and suggests further investigation is required.

A clustered model is used for pooled data.

\*\*Indicate that the estimated coefficient is statistically significant at  $p \leq 0.05$ .

\*\*\*Indicate that the estimated coefficient is statistically significant at  $p \leq 0.01$ .

(not shown) also show non-audit fees are significantly and positively associated with audit fees at less than 1% level. As stated in the literature review, there are two theoretical arguments that imply a negative relationship between audit fees and non-audit fees; the “loss leader” argument creating a threat to auditor independence and the “knowledge spillover” argument which provides an alternative explanation. Because neither of these arguments are supported by the evidence, we infer that the provision of non-audit services does not support the existence of an independence problem in the Norwegian setting.

#### 6.2.2. Hypothesis 2: non-audit services and auditor's opinion

Table 3 shows the results of the logistic regression model, which tests the relationship between the frequency of modified audit reports and the level of non-audit services measured by NAF/(NAF + AF). In testing the relationship between the level of non-audit fees and the frequency of audit qualifications or modifications, we add variable FEEDEP into the regression model. According to Firth (2002), if a client's audit fee makes up a large proportion of the audit firm's total fee income, it is more likely that auditor's independence is going to be impaired. Total audit fees are calculated for each of the audit firms auditing companies in our study. The audit fee for each client is divided by the total audit fees received by its auditor to assess fee dependence. Based on Firth (2002), we predict that FEEDEP is negatively associated with audit opinion if auditor independence is impaired. In each of the three-year sample periods, the coefficients of interest on NAF/(NAF + AF) and FEEDEP are not significant.

**Table 3. Logistic regression of audit opinion, non-audit fees, and control variables**

| $\text{OPINION (0, 1)} = \alpha + \beta_1 \times \frac{\text{NAF}}{(\text{NAF} + \text{AF})} + \beta_2 \times \text{FEEDEP} + \beta_3 \times \text{Ln(TA)} + \beta_4 \times \text{INVREC} + \beta_5 \times \text{ROA} + \beta_6 \times \text{LOSS} + \beta_7 \times \frac{\text{TD}}{\text{TA}} + \beta_8 \times \text{SQRTSUB} + \beta_9 \times \text{BIG4} + \beta_{10} \times \text{MINING} + \varepsilon$ |          |           |           |           |           |           |         |           |           |
|---|----------|-----------|-----------|-----------|-----------|-----------|---------|-----------|-----------|
| Independent Variables   | 2008     |           |           | 2009      |           |           | 2010    |           |           |
|   | Coef.    | Std. err. | $p >  z $ | Coef.     | Std. err. | $p >  z $ | Coef.   | Std. err. | $p >  z $ |
| NAF/(NAF+AF)  | -0.941   | 0.879     | 0.284     | -2.321    | 2.175     | 0.286     | -0.367  | 0.771     | 0.634     |
| FEEDEP  | -16.269  | 23.205    | 0.483     | 12.747    | 12.801    | 0.319     | 0.954   | 4.308     | 0.825     |
| Ln(TA)  | 0.411    | 0.529     | 0.438     | 0.710     | 0.668     | 0.288     | -0.558  | 0.342     | 0.103     |
| INVREC  | -2.830   | 4.759     | 0.552     | 2.051     | 7.745     | 0.791     | -3.459  | 3.580     | 0.334     |
| ROA   | -7.478** | 3.486     | 0.032     | -12.232** | 6.011     | 0.042     | 0.032   | 2.134     | 0.988     |
| LOSS  | 0.000    | 0.001     | 0.999     | 0.001     | 0.001     | 0.989     | 0.000   | 0.001     | 0.997     |
| TD/TA   | 9.010**  | 4.005     | 0.024     | 0.835     | 0.830     | 0.314     | -1.834  | 2.426     | 0.450     |
| CA/CL   | -0.454   | 0.450     | 0.313     | -5.281*   | 2.723     | 0.052     | -0.690  | 0.543     | 0.204     |
| SQRTSUB   | 0.319    | 0.304     | 0.293     | -1.296    | 0.834     | 0.120     | -0.022  | 0.306     | 0.942     |
| BIG4  | 7.445    | 3.388     | 0.986     | 22.026    | 18.036    | 0.889     | -15.997 | 8.505     | 0.970     |
| MINING  | 2.886*   | 1.481     | 0.051     | 0.145     | 1.599     | 0.928     | 1.437   | 1.217     | 0.238     |
| Constant  | -14.838  | 8.725     | 0.089     | -7.344    | 9.260     | 0.428     | 7.013   | 4.372     | 0.109     |
| Model $\chi^2$  | 25.11    |           | 0.005     | 43.53     |           | 0.000     | 15.60   |           | 0.112     |
| Pseudo $R^2$  | 0.454    |           |           | 0.711     |           |           | 0.282   |           |           |
| Number of observations  | 138      |           |           | 139       |           |           | 138     |           |           |

Notes: Table 3 presents the results of the logistic regression model which examines the relationship between the level of non-audit services and audit qualifications or modifications. The sample period is from 2008, 2009 and 2010.

OPINION: 1 if firms received a qualified or modified report, otherwise zero; NAF/(NAF + AF): the ratio of non-audit fees to non-audit fees plus audit fees; FEEDEP: a specific client's sum of audit fees and non-audit fees payment divided by total sum of audit fees and non-audit fees of the auditor; Ln(TA): natural log of total assets; INVREC: ratio of the sum of accounts receivable and inventory to total assets; ROA: ratio of EBIT to total assets; LOSS: 1 if company's ROA is less than zero, otherwise zero; TD/TA: total debt divided by total assets; CA/CL: ratio of current assets to current liabilities; SQRTSUB: square root of the number of subsidiaries; BIG4: 1 if company is audited by a Big Four auditor, otherwise zero; MINING: 1 if the firm operates in mining industry, otherwise zero.

\*Indicate that the estimated coefficient is statistically significant at  $p \leq 0.10$ .

\*\*Indicate that the estimated coefficient is statistically significant at  $p \leq 0.05$ .

The insignificant results fail to provide evidence that there is a negative relationship between the level of non-audit fees and the frequency of modified audit reports.

### 6.2.3. Hypothesis 3: non-audit fees and auditor tenure

Hypothesis 3 tests the relationship between the level of non-audit services and audit tenure. It predicts a positive relationship between non-audit fees and short audit tenure if auditor independence is compromised. The results of the logistic models (model 3) for each year and for the pooled data are presented in Table 4. The variable of interest in this model is NAF/(NAF + AF). A significantly negative coefficient on NAF/(NAF + AF) would imply that a client company is less likely to switch auditors if they pay a high level of non-audit fees relative to audit fees, and thus provides evidence for Hypothesis 3. However, the coefficients on this variable are insignificant.

**Table 4. Logistic regression of auditor switch, non-audit fees, and control variables**

| $\text{SHORT TENURE (0, 1)} = \alpha + \beta_1 \frac{\text{NAF}}{(\text{NAF} + \text{AF})} + \beta_2 \text{OPINION} + \beta_3 \text{Ln(TA)} + \beta_4 \text{INVREC} + \beta_5 \text{ROA} + \beta_6 \text{LOSS} + \beta_7 \text{ROA}$ $+ \beta_8 \frac{\text{TD}}{\text{TA}} + \beta_9 \frac{\text{CA}}{\text{CL}} + \beta_{10} \text{SQRTSUB} + \beta_{11} \text{MINING} + \beta_{12} \text{BIG4} + \beta_{13} \text{2009} + \beta_{14} \text{2010} + \epsilon$ |           |           |         |        |           |         |        |           |         |          |           |         |
|---|-----------|-----------|---------|--------|-----------|---------|--------|-----------|---------|----------|-----------|---------|
|   | 2008      |           |         | 2009   |           |         | 2010   |           |         | Pooled   |           |         |
|   | Coef.     | Std. err. | p-value | Coef.  | Std. err. | p-value | Coef.  | Std. err. | p-value | Coef.    | Std. err. | p-value |
| NAF/(NAF + AF)  | -0.876    | 1.172     | 0.455   | -0.459 | 0.729     | 0.529   | -0.349 | 0.477     | 0.465   | -0.371   | 0.353     | 0.293   |
| OPINION   | 1.957     | 1.623     | 0.228   | N/A    |           |         | 0.530  | 0.954     | 0.578   | 0.218    | 0.700     | 0.756   |
| Ln(TA)  | 0.431     | 0.318     | 0.175   | 0.076  | 0.186     | 0.683   | 0.077  | 0.165     | 0.639   | 0.121    | 0.110     | 0.270   |
| INVREC  | 5.368**   | 2.597     | 0.039   | -0.159 | 1.953     | 0.935   | 0.325  | 1.443     | 0.822   | 0.949    | 0.990     | 0.337   |
| ROA   | -2.355    | 1.590     | 0.139   | -0.605 | 1.558     | 0.697   | -0.124 | 1.457     | 0.932   | -0.635   | 0.742     | 0.392   |
| LOSS  | 0.000     | 0.002     | 0.998   | 0.000  | 0.001     | 0.983   | 0.000  | 0.000     | 0.992   | 0.000    | 0.000     | 0.979   |
| TD/TA   | 0.663     | 1.773     | 0.709   | -0.694 | 1.411     | 0.623   | -0.462 | 1.106     | 0.676   | -0.309   | 0.633     | 0.625   |
| CA/CL   | 0.444**   | 0.212     | 0.036   | 0.009  | 0.073     | 0.902   | -0.027 | 0.048     | 0.578   | 0.003    | 0.032     | 0.921   |
| SQRTSUB   | -0.039    | 0.187     | 0.834   | 0.049  | 0.118     | 0.676   | -0.031 | 0.110     | 0.776   | 0.002    | 0.072     | 0.980   |
| MINING  | -0.602    | 1.316     | 0.648   | -0.247 | 0.774     | 0.749   | 0.386  | 0.597     | 0.518   | -0.003   | 0.416     | 0.995   |
| BIG4  | -1.162    | 1.522     | 0.445   | -0.291 | 1.266     | 0.818   | -1.416 | 0.865     | 0.102   | -0.854   | 0.597     | 0.152   |
| 2009  |           |           |         |        |           |         |        |           |         | 0.537    | 0.442     | 0.224   |
| 2010  |           |           |         |        |           |         |        |           |         | 0.977**  | 0.419     | 0.020   |
| Constant  | -10.241** | 5.072     | 0.043   | -2.418 | 2.714     | 0.373   | -1.036 | 2.398     | 0.666   | -3.446** | 1.632     | 0.035   |
| Model $\chi^2$  | 11.87     |           | 0.374   | 1.97   |           | 0.997   | 4.44   |           | 0.955   | 12.99    |           | 0.449   |
| Pseudo $R^2$  | 0.192     |           |         | 0.020  |           |         | 0.034  |           |         | 0.043    |           |         |
| Number of observations  | 107       |           |         | 118    |           |         | 134    |           |         | 367      |           |         |

Notes: SHORT TENURE: 1 if an auditor's tenure is three years or less, 0 if four years or more; NAF/(NAF + AF): the ratio of non-audit fees to non-audit fees plus audit fees; OPINION: 1 if a company received a qualified or modified report during the study period, otherwise zero; Ln(TA): natural log of total assets; INVREC: ratio of the sum of accounts receivable and inventory to total assets; ROA: ratio of EBIT to total assets; LOSS: 1 if a company's ROA is less than zero, otherwise zero; TD/TA: ratio of total debt to total assets; CA/CL: ratio of current assets to current liabilities; SQRTSUB: square root of the number of subsidiaries; MINING: 1 if company in the mining industry, otherwise zero; BIG 4: 1 if a company is audited by a Big Four auditor, otherwise zero; 2009 and 2010 are year dummies. Table 4 reports the results of the logistic regression model that examines the level of non-audit fees and the length of auditor tenure.

\*\*Indicate that the estimated coefficient is statistically significant at  $p \leq 0.05$ .



Table 5 presents the results of the clustered model for the pooled regression models for short auditor tenure. The coefficients on SHORT TENURE are insignificant, suggesting that there is no relationship between the level of non-audit fees paid by client companies and auditor tenure. On the other hand, Ln(AF) is significantly positively associated with variable Ln(NAF) at the one percent level in both years, suggesting that companies who pay more audit fees also pay more non-audit fees. In sum, taking results from the logistic regression model (model 3) and the OLS regression model (model 4) together, there is no evidence for Hypothesis 3.

#### 6.2.4. Unexpected or excess fees and cost of debt

Excess fee and cost of debt are based on a two-step procedure with fee models identified in equation 5 (which are pooled models controlling for year and 7 SIC code industries) and the COD model identified in equation 6. This procedure is similar to Hope et al. (2009). A year by year model (not reported) provided similar results. In this analysis we do not use robust vce to allow us to find standardized residuals afterwards. The results show no evidence to support the hypothesis of higher costs of debt when there are excess audit fees or non-audit fees (Table 6).

**Table 5. OLS regression of auditor tenure, non-audit fees, and control variables**

$$\text{Ln(NAF)} = \alpha + \beta_1 \text{SHORT TENURE} + \beta_2 \text{Ln(TA)} + \beta_3 \text{Ln(AF)} + \beta_4 \text{INVREC} + \beta_5 \text{SQRTSUB}$$

$$+ \beta_6 \text{ROA} + \beta_7 \text{LOSS} + \beta_8 \frac{\text{TD}}{\text{TA}} + \beta_9 \frac{\text{CA}}{\text{CL}} + \beta_{10} \text{OPINION} + \beta_{11} \text{BIG4} + \beta_{12} \text{MINING} + \beta_{13} \text{2009} + \beta_{14} \text{2010} + \varepsilon$$

| Independent Variable    | Coef.    | t-statistic | p-value |
|-------------------------|----------|-------------|---------|
| SHORT TENURE            | 0.222    | 0.970       | 0.335   |
| Ln(TA)                  | 0.003    | 0.030       | 0.972   |
| Ln(AF)                  | 0.731*** | 6.510       | 0.000   |
| INVREC                  | -0.221   | -0.430      | 0.668   |
| SQRTSUB                 | 0.078*   | 1.830       | 0.069   |
| ROA                     | 0.071    | 0.180       | 0.854   |
| LOSS                    | 0.000    | -0.460      | 0.643   |
| TD/TA                   | -0.014   | -0.120      | 0.906   |
| CA/CL                   | 0.002    | 0.120       | 0.904   |
| OPINION                 | -0.271   | -0.720      | 0.471   |
| BIG4                    | 0.819**  | 2.260       | 0.024   |
| MINING                  | -0.013   | -0.060      | 0.953   |
| 2009                    | -0.047   | -0.240      | 0.814   |
| 2010                    | -0.198   | -1.000      | 0.319   |
| Constant                | 0.037    | 0.040       | 0.965   |
| R <sup>2</sup>          | 0.384    |             |         |
| Adjusted R <sup>2</sup> | 0.360    |             |         |
| F-statistic             | 15       |             | 0.000   |
| Number of observations  | 367      |             |         |

Notes: Table 5 presents the results of the OLS regression model that examines the relationship between non-audit fees and the length of audit tenure. The sample period is from 2008 to 2010. Ln(NAF): natural log of non-audit fees; SHORT TENURE: 1 if an auditor's tenure is three years or less, 0 if four years or more; Ln(TA): natural log of total assets; Ln(AF): natural log of audit fees; INVREC: ratio of the sum of accounts receivable and inventory to total assets; SQRTSUB: square root of the number of subsidiaries; ROA: ratio of EBIT to total assets; LOSS: 1 if a company's ROA is less than zero, otherwise zero; TD/TA: ratio of total debt to total assets; CA/CL: ratio of current assets to current liabilities; OPINION: 1 if a firm received qualified or modified report during the study period, otherwise zero; BIG 4: 1 if a company is audited by a Big Four auditor, otherwise zero; MINING: 1 if a firm operates in the mining industry, otherwise zero; 2009, 2010: year dummies. Robust t-statistics are reported.

Adjusted R<sup>2</sup> is not strictly relevant when robust standard errors are used, but is reported for comparability.

\*Indicate that the estimated coefficient is statistically significant at  $p \leq 0.10$ .

\*\*Indicate that the estimated coefficient is statistically significant at  $p \leq 0.05$ .

\*\*\*Indicate that the estimated coefficient is statistically significant at  $p \leq 0.01$ .

**Table 6. Regression of cost of debt on excess fee measures and control variables**

| COD                    | Excess NAF/(NAF+AF) |        |       | Excess Ln(AF) |        |       | Excess Ln(TF) |        |       | Excess Ln(NAF) |        |       |
|------------------------|---------------------|--------|-------|---------------|--------|-------|---------------|--------|-------|----------------|--------|-------|
|                        | Coef.               | t      | p     | Coef.         | t      | p     | Coef.         | t      | p     | Coef.          | t      | p     |
| EXCESSFEE              | -0.000851           | -0.340 | 0.734 | 0.000632      | 0.440  | 0.663 | 0.001196      | 0.810  | 0.416 | 0.0007470      | 0.440  | 0.664 |
| LnTA                   | 0.000354            | 0.430  | 0.665 | 0.000312      | 0.370  | 0.712 | 0.000309      | 0.360  | 0.718 | 0.0003328      | 0.390  | 0.693 |
| TD/TA                  | -0.000325           | -0.150 | 0.883 | -0.000265     | -0.120 | 0.903 | -0.000310     | -0.140 | 0.889 | -0.0003012     | -0.140 | 0.891 |
| ROA                    | -0.035811           | -2.040 | 0.042 | -0.035647     | -2.030 | 0.043 | -0.035608     | -2.020 | 0.044 | -0.0357794     | -2.040 | 0.042 |
| INTCOV                 | 0.000002            | 1.470  | 0.141 | 0.000002      | 1.480  | 0.139 | 0.000002      | 1.470  | 0.142 | 0.0000018      | 1.480  | 0.140 |
| $\sigma$ (NIBE)        | -0.007900           | -0.700 | 0.485 | -0.008366     | -0.740 | 0.460 | -0.008500     | -0.760 | 0.446 | -0.0080652     | -0.720 | 0.472 |
| TANGIBLE-toTA          | 0.000432            | 1.780  | 0.076 | 0.000442      | 1.820  | 0.069 | 0.000443      | 1.820  | 0.069 | 0.0004390      | 1.810  | 0.071 |
| SALES-GROWTH           | 0.001892            | 0.800  | 0.425 | 0.001878      | 0.800  | 0.427 | 0.001958      | 0.830  | 0.405 | 0.0018960      | 0.800  | 0.424 |
| NEGEQUITY              | 0.000499            | 0.050  | 0.961 | 0.000239      | 0.020  | 0.982 | 0.000562      | 0.050  | 0.958 | 0.0003412      | 0.030  | 0.974 |
| Constant               | 0.031547            | 2.360  | 0.019 | 0.032181      | 2.330  | 0.020 | 0.032211      | 2.310  | 0.021 | 0.0318636      | 2.320  | 0.021 |
| R <sup>2</sup>         | 0.068               |        |       | 0.068         |        |       | 0.069         |        |       | 0.068          |        |       |
| F-statistic            | 1.490               |        | 0.148 | 1.280         |        | 0.246 | 1.480         |        | 0.154 | 1.440          |        | 0.170 |
| Number of observations | 391                 |        |       | 391           |        |       | 391           |        |       | 391            |        |       |

Notes: Table 6 presents the results from the regression model which investigates the relationship between excess audit or non-audit fees and interest expense with control variables. The sample period is from 2008 to 2010. The excess fees are estimated using a model of fees (dependent variable) and Ln(TA), INVREC, SQRTSUB, ROA, LOSS, TDTA, CACL, BIG 4, and OPINION (independent variables).

EXCESSFEE represents, respectively, excess NAF/(NAF + AF) (columns 2–4); excess Ln(AF) (columns 5–7); excess Ln(TF) (columns 8–10); and excess Ln(NAF) (columns 11–13).

COD: interest expense to average debt (dependent variable); NAF/(NAF + AF): the ratio of non-audit fees to non-audit fees plus audit fees; Ln(AF): natural log of audit fees; Ln(TF): natural log of no-audit fees plus audit fees; Ln(NAF): natural log of non-audit fees; Ln(TA): natural log of total assets; TD/TA: ratio of total debt to total assets; ROA: ratio of EBIT to total assets; INTCOV: the ratio of operating income to interest expense;  $\sigma$ (NIBE): the standard deviation of net income before extraordinary items, scaled by average assets, over the past five years; TANGIBLEtoTA: tangible assets divided by total assets; SALESGROWTH: Growth in sales; NEGEQUITY: Dummy variable equal to 1 if equity is zero, 0 otherwise.

t-statistics are computed using robust standard errors.

A clustered model is used for pooled data.

We conduct extensive robustness tests of our results. Two-stage least squares is used to investigate whether audit fees and non-audit fees are simultaneously determined as found by Whisenant et al. (2003) and other recent papers. The two-stage least squares model uses NEWFIN (increase in equity capital from new stock issues) as an instrumental variable consistent with Whisenant et al., (2003) and Krishnan and Yu, (2011).<sup>4</sup> The results show evidence that audit fees and non-audit fees are jointly determined (see Table 7). There is still no evidence of loss of independence, because in this model there is no significant relationship between audit fees and non-audit fees. We also conduct a further test of Hypothesis 2 by estimating a model in which the dependent variable was Ln(NAF) and the independent variables included OPINION and control variables. There is no significant relationship between audit opinion and non-audit fees. We also re-estimate model (2) using FEEDEP as a measure for loss of independence, and also find insignificant results. In addition, since the number of observations with non-Big 4 auditors is quite small, we run all of the tests again with non-Big 4 observations excluded. The results are very similar to those shown in the paper. The results of the robustness tests also do not provide any evidence that auditors lose their independence when they provide non-audit services.

**Table 7. Pooled 2SLS model of audit fees, non-audit fees, and control variables**

$$\text{Ln(AF)} = \alpha + \beta_1 \text{Ln(NAF)} + \beta_2 \text{Ln(TA)} + \beta_3 \text{INVREC} + \beta_4 \text{SQRTSUB} + \beta_5 \text{ROA} + \beta_6 \text{LOSS} \\ + \beta_7 \frac{\text{TD}}{\text{TA}} + \beta_8 \frac{\text{CA}}{\text{CL}} + \beta_9 \text{BIG4} + \beta_{10} \text{OPINION} + \epsilon$$

| Independent Variables   | Coef.    | t-statistic | p-value |
|-------------------------|----------|-------------|---------|
| Ln(NAF)                 | -0.492   | -0.77       | 0.441   |
| Ln(TA)                  | 0.541**  | 2.54        | 0.012   |
| INVREC                  | 1.874**  | 2.33        | 0.021   |
| ROA                     | -0.312   | -0.90       | 0.370   |
| LOSS                    | 0.000*** | 3.99        | 0.000   |
| TD/TA                   | -0.010   | -0.16       | 0.875   |
| CA/CL                   | -0.015   | -1.22       | 0.225   |
| SQRTSUB                 | 0.281**  | 2.25        | 0.026   |
| BIG 4                   | 0.362    | 0.45        | 0.651   |
| OPINION                 | 0.094    | 0.27        | 0.789   |
| Constant                | 0.775    | 0.76        | 0.450   |
| R <sup>2</sup>          | 0.082    |             |         |
| Adjusted R <sup>2</sup> | 0.059    |             |         |
| F-statistic             | 168***   |             | 0.000   |
| Number of observations  | 415      |             |         |

Notes: Table 7 presents the results from the 2SLS regression model which investigates the relationship between audit fees and non-audit fees. The sample period is from 2008 to 2010. The instrumental variables are Ln(TA), INVREC, SQRTSUB, ROA, LOSS, TDTA, CACL, BIG 4, OPINION, and NEWFIN.

Ln(AF): natural log of audit fees (dependent variable); Ln(NAF): natural log of non-audit fees; Ln(TA): natural log of total assets; INVREC: ratio of the sum of inventory and accounts receivable to total assets; ROA: ratio of EBIT to total assets; LOSS: 1 if company's ROA is less than zero, otherwise zero; TD/TA: ratio of total debt to total assets; CA/CL: ratio of current assets to current liabilities; SQRTSUB: square root of the number of subsidiaries; BIG 4: 1 if company is audited by a Big Four audit firm, otherwise zero; OPINION: 1 if firms received a qualified or modified report, otherwise zero; NEWFIN: increase in equity capital from new stock issues.

t-statistics are computed using robust standard errors.

A clustered model is used for pooled data.

\*\*Indicate that the estimated coefficient is statistically significant at  $p \leq 0.05$ .

\*\*\*Indicate that the estimated coefficient is statistically significant at  $p \leq 0.01$ .

## 7. Conclusion

We examine whether auditors lose independence as a result of providing non-audit services using a sample of Norwegian public companies. The overall results of our study do not present evidence to support the widespread belief that provision of non-audit services might impair auditor independence. These Norwegian results provide further evidence to that in prior similar studies, with more extensive tests and more recent data. Moreover, the tests used to investigate the relationship between the level of non-audit fees and auditor's opinions (i.e. the frequency with which an auditor issues qualified or modified reports) fail to find any evidence of auditor independence being impaired. Similarly, the tests examining the relationship between the length of auditor tenure and non-audit services also fail to find any evidence to support loss of independence. In addition, tests of unexpected or excess fees and the cost of debt also do not provide any evidence of loss of independence in appearance. We learn from the results that, despite concerns about auditors losing their independence when they provide non-audit services, there is no evidence that they do, using a range of different tests.

This study extends previous studies mainly from the United States, United Kingdom, and Australian to another country, and adds more evidence to the longstanding debate whether providing non-audit services impairs auditor independence. Our results from the Norwegian setting characterized

by the Scandinavian legal system and the context of tightened independence regulation show there is a lack of evidence to support the idea that auditors might lose independence when they provide non-audit services to clients.

However, there are some limitations in this study which should be taken into consideration when interpreting the results. The results of the regression models fail to find evidence to support the “problem firm” argument. However, “problem firms” might have other problems which are not reflected in financial statements and these changes might lead to greater demand for both audit and non-audit services. For example, changes in firms’ management might be another reason for a positive relationship between audit fees and non-audit fees. However, we could not examine that possibility because of the lack of relevant data. We also acknowledge the limitation of the possible inferences due to the small number of incidences (e.g. modified audit opinions). At the same time we need to stress that the sample reflects the full population of listed non-financial companies at the time, hence this information corresponds to the available information.

Further research should investigate other possible methods to examine the issue of effect of the provision of non-audit services on auditor independence issue. As Eilifsen and Knivsflå (2013) discussed in their study, it might be difficult to separate the effect of non-audit services on auditor independence from the benefits of knowledge spillovers, and therefore the overall lack of evidence that the provision of non-audit services hinders auditor independence might reflect a balancing of the benefit of knowledge spillovers. Moreover, regulatory changes and audit quality are possible influences on the net balance between the effect of non-audit services on auditor independence and knowledge spillover benefits (Francis, 2004; Ghosh, Kallapur, & Moon, 2009). Also, further research in Norway could examine whether the provision of non-audit services has a different impact on auditor independence before and after the future changes in legislation.<sup>5</sup>

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#### Notes

1. Although Norway is not a member state of the EU, it is a party to the Agreement on the European Economic Area (EEA). This EEA Agreement generally includes Norway in the internal market of the EU (Norwegian Ministry of Finance, 2009). Hence, Norway implements the EU Law Directives (Eilifsen, 1998).
2. The Financial Supervisory Authority of Norway is an independent government agency that is responsible for the supervision of the financial market (e.g. banks, financial companies, external accountants and auditors, and so on).
3. Robust standard errors for heteroskedasticity are used. Variance inflation factors and condition numbers indicate that there is no evidence of multicollinearity problems.

4. While the use of the Heckman two-stage method has been criticised in a recent paper by Lennox, Francis, and Wang (2012), because self-selection models can be sensitive to changes in model specification, in this case the  $R^2$  in the first stage model is quite high.
5. For example, Eilifsen and Knivsflå (2013) investigate the regulatory influence on investors’ perceptions about audit firms providing non-audit services at the time of an earlier change. They take advantage of the regulatory changes made in 2003 in Norway, which further tightens the rules on non-audit services. An innovative method is used, in which they use earnings response coefficients (ERC) as the measure of investors’ perception of non-audit services in examining the relationship between ERC and non-audit services before, during, and after the Financial Supervisory Authority of Norway’s criticism of the provision of non-audit services by auditors (Eilifsen & Knivsflå, 2013). Moreover, the study takes into consideration quality of an audit when analyzing investors’ perceptions of non-audit services, using audit firm size and auditor specialisation as proxies for audit quality (Eilifsen & Knivsflå, 2013).

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