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**Interdependencies between Elements of  
Governance and Auditing: Evidence from  
Germany**

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# Interdependencies between Elements of Governance and Auditing: Evidence from Germany

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## Abstract

This study is the first to examine empirically the relation between audit fees, client and governance attributes in Germany. Auditing is an essential element in the system of corporate governance. Further elements include internal control institutions and management compensation. All these elements of corporate governance are designed to reduce agency problems and information asymmetries. Therefore, interdependencies between these instruments are likely to exist. This study differs from existing research on the association between audit fees and governance institutions as it explicitly considers the German governance regime with its two-tier board system. Using data from German stock market companies, we examine whether governance elements complement or substitute the monitoring role of auditing. After adjustments for size effects, the regression results suggest that the ratio of bonus to total payments as well as the existence of an audit committee significantly lower audit fees.

**Key Words:** Audit Fees, Corporate Governance, Management Compensation

**JEL Classification:** M42

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# 1 Introduction

Audit services are an important element in the system of corporate governance. Further instruments include the design of management compensation and the effectiveness of internal monitoring. Since all instruments are designed to reduce problems arising from agency conflicts and information asymmetries, interdependencies are likely to exist. For example, thorough control by the board or effective alignment of managerial and investors' incentives could be offset against audit effort. Given that audit fees reflect audit effort and client-specific risk (Simunic, 1980), governance structures should have a measurable impact on audit fees.

Recent empirical studies on audit fees have focused on measures of internal monitoring like board characteristics and management incentives. However, these studies are mainly based on data from common law countries with a one-tier board system. Hence, we question whether these results hold for a different governance regime, namely the German two-tier board system. Empirical research on audit fees in Germany is still rare, as information on audit fees, management compensation and supervisory board characteristics was not available in the past. Changes in legislation now induce listed companies in Germany to disclose this information. These regulatory changes aim at providing higher transparency and to improve corporate governance and audit quality. Using data from German stock market companies this study is the first to examine how control mechanisms and compensation incentives for the management interact with the monitoring role of auditing in a two-tier board setting.

Following the meta-analysis of Hay et al. (2006), we examine whether the effectiveness of governance instruments might affect costs of external auditing. Thus, the paper contributes to the growing literature focusing on the relations between auditing, different elements of internal control and managerial incentives (Davila/Penalva, 2006; Vafeas/Waegelien, 2007).

Building on Simunic (1980), two standard model specifications considering client and auditor characteristics as well as governance aspects are used. The first model attempts to explain audit fees by companies' size and further client, auditor and governance attributes. Since governance characteristics seem to be size-related, the second model

specification adjusts for company size in order to identify the impact of different governance instruments more precisely. Regarding the influence of client and auditor characteristics on audit fees, our results are mainly in line with prior research. However, in contrast to previous studies our results predominantly do not suggest reputation effects on audit fees. Additionally, in the size-adjusted model setting we find that diligent internal monitoring and effective alignment of interests lower the cost of external auditing.

The paper is organised as follows. In section 2 we discuss prior literature and section 3 provides institutional background information on the German system of corporate governance. Hereupon, we describe our sample and specify our hypotheses. Results are reported and discussed in section 4. Additionally, we provide tests on subsamples and sensitivity analyses. Section 5 concludes and summarizes the key findings of our study.

## 2 Literature and Prior Research

In their meta-analysis of empirical models on audit fees, Hay et al. (2006) identify two main reasons of prior research on audit fees: First, fees might be indicative in order to infer on the competition in audit markets. Second, they provide evidence on the extent and possible constraints of auditor independence. Additionally to these well-established rationales for empirical research, recent studies focus on a third aspect. In order to gain a more comprehensive understanding of the interactions between elements of corporate governance, they explicitly consider the composition of management compensation or board characteristics (Carcello et al., 2002; Abbott et al., 2003a; Gul et al., 2003; Chen et al., 2005).

The seminal audit pricing model developed by Simunic (1980) considers client characteristics like size, complexity, profitability and client specific risk. His results suggest that these variables have a significant impact on audit fees. Empirical evidence from US and European data confirms that business risk is positively linked with audit fees, increasing both the total sum of hours per audit and the billing rate per hour (Simunic/Stein, 1996; Bell et al., 2001; Niemi, 2002). Francis/Wilson (1988) and DeFond

(1992) show an association between clients' degree of agency conflicts (e.g., ownership structure or leverage) and the choice of audit quality.

Francis (1984) finds evidence for product differentiation that is linked to audit firm size in the Australian audit market. Subsequent studies deepen this analysis (Palmrose, 1986a; Craswell et al., 1995). Unlike Simunic (1980), they find significant evidence that auditors providing a higher number of reports and possessing larger market shares or a better reputation tend to charge higher audit fees. Further studies focus on characteristics of the auditor-client relationship. For example, the joint supply of audit and non-audit services could cause economies of scope which are likely to reduce audit fees. The "loss-leader" function of audits (Simunic, 1984; Hillison/Kennelley, 1988) implies that low priced audits secure a competitive advantage and might lead to profitable consultancy services. Nevertheless, empirical results predominantly support a positive relation between audit fees and fees for non-audit services (Palmrose, 1986b; Firth, 1997; Ashbaugh et al., 2003). High price elasticity of demand for audit services could be one reason for this finding.

However, demand for auditing might not only be seen as a consequence of agency conflicts or information asymmetries (Jensen/Meckling, 1976). Companies can resort to different instruments to mitigate these problems. Namely, elements of corporate governance such as board characteristics and management compensation are likely to interact with external control by an auditor. Although some recent studies address interdependencies between auditing, executive compensation and further instruments of corporate governance (Carcello et al., 2002; Abbott et al., 2003a; Chen et al., 2005), there is a continuing interest in the research on these interrelations (Hay et al., 2006) because "the role of corporate governance is largely ignored in the research" (Larcker/Richardson, 2004, p. 626).

For example, board characteristics can be interrelated with audit fees in two ways. On the one hand, effective control by the board or its committees might substitute for external control. Taking a supply-side perspective, auditors expecting the board to fulfill the governance role could induce lower audit effort and fees. On the other hand, joint use of these instruments enables companies to attain higher levels of corporate

control. For instance, independent and diligent board members could be inclined to demand higher quality audits because they are more concerned about their reputation. Carcello et al. (2002) employ proxies for the independence, diligence and expertise of corporate boards in a fee regression model and find a significant positive association with audit fees.

As "audit committees liaise between the management, internal and external auditors" (Chen et al., 2005, p. 218), setting up an adequate audit committee should result in measurable effects on audit services. Gaynor et al. (2006) highlight the growing importance of audit committees and their responsibility for governance and audit quality. In an experimental setting they find that audit committees abstain from benefits to audit quality which can be attained by a joint provision of audit and non-audit services. If fees are published, disclosure might have negative effects on investors' perceptions. Chen et al. (2005) use measures like the proportion of outside members and the number of meetings in order to explain whether attributes of the audit committee have an impact on auditor selection. They state that effectiveness of the audit committee and audit quality which is operationalized by auditors' industry specialization are complementary aspects of corporate governance. Abbott et al. (2003b) find that audit committee independence and expertise have a significantly positive impact on audit fees. Using belgian data, Knechel/Willekens (2006) also observe that audit fees increase when the proportion of independent board members and the financial risk are high and an audit committee exists. These complementary relations are explained by positive control externalities among stakeholders (e.g., debtholders) as well as sharing of control costs.

In a recent study, Mitra et al. (2007) extend previous audit fee research by including ownership characteristics. The results document a negative impact of institutional blockholders as well as a positive effect of diffused institutional stock ownership on audit fees. From a supply-side perspective, audit risk is likely to diminish if blockholders exert an active role in monitoring the management. In contrast, a demand-side view would suggest an increasing audit coverage, as blockholders are able to enforce an effective control of the reliability of disclosed information.

In addition to the above mentioned governance characteristics, audit fees might be

driven by management compensation. Based on agency theory arguments, incentive structures in firms play an important role to align managers' and shareholders' interests. Gul et al. (2003) include managerial share ownership and executive compensation as measures of management incentives in their audit fee model. Using proxies and interaction terms indicating management remuneration and earnings management, they find a positive impact of compensation levels on audit fees. However, as compensation is often based on financial performance measures, there are reasons for managers to manipulate financial statements to achieve higher remuneration (Healy, 1985; Holthausen et al., 1995). If earnings management is expected to increase management compensation, audit fees are likely to rise because shareholders' representatives are inclined to enhance external monitoring. In contrast, effective alignment of shareholder and management interests by means of appropriate remuneration plans can mitigate agency conflicts, thereby potentially lowering the demand for external control by auditors. Vafeas/Waegelien (2007) find evidence that an increasing fraction of long-term executive compensation on overall CEO pay lowers the demand for audit services.

In our analysis, we consider board characteristics as well as management incentives to explain variation in audit fees. Building on Vafeas/Waegelien (2007) and Knechel/Willekens (2006), we question whether substitutive or complementary relations between elements of corporate governance apparent in previous studies can be found in a different corporate governance setting, namely the German two-tier board system. Beyond client proxies our fee model includes variables representing the structure of management compensation and board characteristics. To control for stakeholder conflicts we include proxies for the existence of blockholders and the importance of creditors.

### **3 Empirical setting and research methodology**

#### **3.1 Institutional background and data**

To analyse whether control mechanisms and compensation incentives for the management interact with the monitoring role of auditing, we use a dataset consisting of German publicly traded companies. The system of corporate governance in Germany

features some characteristics which differ significantly from the institutional settings in the US. For the focus of this study it is particularly relevant to take into account the dual board structure in Germany which separates management and control. The German Companies Act (AktG) requires stock corporations to establish a supervisory board (Aufsichtsrat) representing owners' interests and a management board (Vorstand). The function of the former is both to supervise and to give advice to the management board. According to the German Corporate Governance Code, the supervisory board shall form committees, e.g., a nomination committee and an audit committee, to enhance the efficiency of its work. However, setting up an audit committee is not required by law and remains at the discretion of each company.<sup>1</sup> The supervisory board appoints the auditor, as prescribed by the German Commercial Code (§ 318 HGB). It agrees both on the fees paid to the auditor and on the management compensation. Thus, the supervisory board decides on the degree of external monitoring which can partly<sup>2</sup> be substituted or complemented by the supervisory boards' effort and effective alignment of managements' and shareholders' interests. According to the German Corporate Governance Code and German Commercial Code (§§ 285, 314 HGB), listed companies have to disclose detailed information on individual management compensation, unless the general meeting decides to abandon individualized disclosure. The Corporate Governance Code recommends that compensation contracts should include short- and long-term performance-based components. Disclosure on management compensation typically differentiates between fixed and short-term performance-related as well as long-term incentive components.

The monitoring role of auditing involves to discover and to report misstatements in financial reporting in compliance with the German Commercial Code (§ 317 HGB) and standards of the German institute of certified public accountants (Institut der Wirtschaftsprüfer). Legal requirements on auditing significantly changed the audit environment in recent years (for a detailed view on German audit market reforms see Gassen/Skaife, 2007). The German Commercial Code states that fees paid to the auditor must be disclosed in the financial statement for the financial year in which

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<sup>1</sup> In contrast, SEC regulations require companies listed in the US to set up an audit committee.

<sup>2</sup> Legal regulations define a minimum level of audit quality to be met.

services are provided.<sup>3</sup> There are four categories audit fees must be assigned to. For our analysis, we differentiate between fees for the financial statement audit and fees for non-audit services (i.e., other assurance and valuation services, tax services and other services).

Data were gathered from annual group reports of companies listed in the German Prime Standard in 2006. We collect financial information from the Hoppenstedt and DAFNE databases. Governance characteristics, management compensation as well as audit fees and missing financial information were manually taken from annual reports. The sample includes a total of 387 companies. 66 observations were excluded because of missing data. Moreover, we did not include 40 companies with group headquarters not being located in Germany, as these companies face different regulatory requirements. For similar reasons, we dropped 15 companies in the banking and insurance sector. Thus, the final sample consists of 266 companies. In 27 cases the fiscal year did not coincide with the calendar year and reports published between July 1st 2006 and June 30th 2007 were assigned as 2006 annual report. As disclosure of management compensation had not been mandatory before 2006, we perform a cross-sectional analysis. The audit fees used in our study are disclosed in the consolidated group reports. Table 1 reports details on dependent and independent variables. Descriptive statistics are presented in table 2.

Table 3 shows differences in audit fees and management compensation between industries. We use 15 industries following the industry classification of the Deutsche Börse. The descriptive statistics provide evidence for substantial variation in the level of audit fees and management compensation across industries. Hence, we include industry dummies in the regression models.

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<sup>3</sup> For a first descriptive study on audit fees in Germany see Lenz et al. (2006).

Table 1: Variable Definitions

Independent Variables	Definition
LN(AF)	Logarithm of audit fees
AF/TA	Audit fees/Total assets (total assets in € 000s)
<b>Dependent Variables</b>	
<b>Client Proxies</b>	
TA	Total assets
LN(TA)	Logarithm of total assets
LN(SUB)	Logarithm of number of subsidiaries
ROA	Net Income/total assets
LEV	Debt/total assets
OWN25	Ownership structure =1, if one owner holds more than 25% of shares, 0 otherwise
IND	Industry dummy
<b>Auditor Proxies</b>	
BIG4	Dummy variable = 1 if audit firm is BIG 4, 0 otherwise
NAS	Dummy variable = 1 if audit firm provides non-audit services, 0 otherwise
<b>Corporate Governance Proxies</b>	
MEET	Number of meetings of the supervisory board
AC	Dummy Variable=1 if the company has an audit committee, 0 otherwise
MC Ratio	Ratio of bonus compensation/total compensation
SOP	Dummy Variable=1 if a stock option programm exists, 0 otherwise

Table 2: Descriptive Statistics

<b>Continous Variables:</b>	Mean	Median	Std.dev.	Max.	Min.
AF (€ 000s)	1623	206	6650	62000	25
LN(AF)	12.538	12.240	1.456	17.943	10.127
TA(€ 000s)	6153821	228926	24828005	217698000	1782
AF/TA(€ 000s)	1.494	0.939	2.396	30.864	0.0185
LN(TA)	19.601	19.249	2.196	26.106	14.106
SUB	61.39	15.00	142.772	1164	1
LN(SUB)	2.930	2.708	1.439	7.060	0.000
ROA	0.088	0.054	0.103	0.616	0.000
LEV	0.542	0.557	0.294	3.891	0.018
MEET	5.57	5,00	2.090	17	2
MC Ratio	0.373	0,381	0.226	0.8392	0.000
<b>Binary Variables:</b>					
OWN25	0.5	0.5	0.501		
NAS	0.65	1	0.477		
BIG4	0.68	1	0.467		
AC	0.49	0	0.501		
SOP	0.59	1	0.493		

In case of binary variables the percentage value is reported.

Table 3: Mean Audit Fees &amp; Management Compensation by Industries

Industry	Number	Percentage	mean AF (€ 000s)	mean Compensation (€ 000s)
Automobile	8	3%	9,077.375	8,577.577
Construction	6	2%	1,652.667	5,868.102
Chemicals	10	4%	5,281.400	6,869.279
Retail	19	7%	578.000	2,797.717
Financial Services	20	8%	422.560	2,795.767
Basic Resources	3	1%	675.000	2,733.065
Industrial	72	27%	1,395.457	2,270.452
Consumer	13	5%	922.431	4,650.413
Media	13	5%	264.508	1,993.288
Pharma & Healthcare	25	9%	661.774	2,955.087
Software	42	16%	307.889	1,267.052
Technology	19	7%	490.148	1,424.724
Telecommunication	6	2%	4,810.500	3,539.643
Transportation & Logistics	7	3%	3,045.571	5,707.130
Utilities	3	1%	23,381.667	9,930.452
Total	266	100%		

### 3.2 Research design and model specification

Referring to the meta-analysis of Hay et al. (2006), our audit fee models incorporate client, auditor and governance attributes. Typically, client attributes include measures of size, complexity and risk. Auditor attributes proxy audit quality by measures of audit firms' size and reputation. Furthermore, the provision of non-audit services could have an impact on audit fees, as it might create economies of scope or impair auditor independence. To derive measures of corporate governance quality, we refer to provisions made by the German Corporate Governance Code as well as by the German Commercial Code Law. Explanatory and dependent variables are defined in table 1. In audit fee regression models, the dependent variable is either audit fees deflated by assets or the natural logarithm of audit fees (Simunic, 1980; Maher et al., 1992; Carcello et al., 2002). Thus, we estimate the following regression models:

$$\begin{aligned}
 LN(AF) = & \alpha + \beta_1 LN(TA) + \beta_2 LN(SUB) + \beta_3 |ROA| + \beta_4 LEV & (1) \\
 & + \beta_5 OWN25 + \beta_6 BIG4 + \beta_7 NAS + \beta_8 AC + \beta_9 MEET \\
 & + \beta_{10} MCRatio + \beta_{11} SOP + \sum_{i=1}^{14} \beta_{11+i} IND_i
 \end{aligned}$$

This first model explicitly measures the effect of company size by an explanatory variable, implying a non-linear impact of size on audit fees. In contrast, the second model uses audit fees divided by total assets.<sup>4</sup> Pearson correlations between the dependent and the explanatory variables change their direction compared to the first model except for LN(SUB), OWN25 and SOP (see table 4). LN(TA) is significantly correlated with other independent variables, especially governance attributes like the existence of an audit committee or the management compensation. Therefore, we use the following model specification in order to abstract from size effects. This should allow to identify the impact of corporate governance institutions more clearly.

$$\begin{aligned} \frac{AF}{TA} = & \alpha + \beta_1 LN(SUB) + \beta_2 |ROA| + \beta_3 LEV + \beta_4 OWN25 & (2) \\ & + \beta_5 BIG4 + \beta_6 NAS + \beta_7 AC + \beta_8 MEET \\ & + \beta_9 MCRatio + \beta_{10} SOP + \sum_{i=1}^{14} \beta_{10+i} IND_i \end{aligned}$$

As corporate size has a strong impact on effort required for a thorough audit and may influence audit fees, LN(TA) is used as an explanatory variable in equation 1. We additionally employ the logarithm of the number of subsidiaries (LN(SUB)) to capture client complexity. The absolute return on assets ( $|ROA|$ ) is not only a proxy for profitability, but also reflects incentives for earnings management. Using the absolute value of return on assets presumes that increasing positive and negative returns have a similar impact on audit fees. Very profitable companies could demand comprehensive audits leading to high fees which might signal the quality of the financial information to investors and stakeholders. If companies report high losses, auditors are confronted with a higher inherent risk which should be offset by fees. Otherwise, audit firms could resign from their engagement (Bockus/Gigler, 1998; De/Sen, 2002). A negative impact of  $|ROA|$  could result from earnings management, especially if incentives to avoid the disclosure of small losses exist (Burgstahler/Dichev, 1997). To operationalize bankruptcy risk and agency conflicts, the ratio of debt to total assets (LEV) and a rough proxy for ownership structure (OWN25) are included. Creditors exert a monitoring role and influence the management and its decisions. In Germany, financing of companies is predominantly assured by creditors and bank representatives often join

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<sup>4</sup> Carcello et al., 2002 use a similar specification as a sensitivity analysis.

the supervisory board. Ownership structure is likely to contribute to the system of corporate control. Active monitoring by blockholders reduces the inherent risk, potentially leading to lower audit fees. On the other hand, extensive audit coverage could be demanded by influential shareholders. Therefore, one can expect a positive influence of ownership concentration on audit fees to provide reliability of earnings information. Besides this monitoring function, debt financing can cause disadvantages because of increased risk of financial distress (e.g. due to illiquidity). Substantial shareholders are able to implement a higher quality of internal and external control. Therefore, it could be assumed that companies with a more concentrated ownership structure have a higher demand for audit services. The above reasoning suggests a positive influence of client size and complexity on audit fees. With respect to  $|\text{ROA}|$ , LEV and concentration of ownership (OWN25) the sign of the coefficients cannot be predicted.

To control for characteristics of the auditor and the auditor-client relationship, we include BIG4 and NAS as indicators for the impact of auditor reputation and the provision of non-audit services. The biggest audit firms (KPMG, PWC, Ernst & Young and Deloitte) hold a market share of approximately 68 percent of the audit market for the German listed companies included in our sample. Due to differences in size, expertise and reputation, fees for "Big 4" audits are supposed to vary from those of minor auditing firms. Oligopolistic market structures as well as economies of scope might be alternative explanations for differences in audit fees. While the first is likely to increase the expenses for "Big 4" audits, the latter tends to lower "Big 4" fees, if cost-savings are passed to the clients.

To control for the impact of non-audit services (NAS) on audit fees, we include a dummy variable indicating if non-audit services were also provided. In addition, we use the value of nonaudit service fees (VNAS) as a sensitivity analysis. While theoretical literature predominantly proposes an inverse relation between non-audit services and audit fees, empirical evidence mainly suggests a positive effect.

In this study, we focus on interdependencies between different mechanisms of corporate control, namely the supervisory board, auditors, and management. In particular,

we question whether the supervisory board's diligence and effectiveness serve as complements or substitutes to external auditing. The number of meetings (MEET) is a commonly used proxy for the diligence of the supervisory board (e.g., Carcello et al., 2002; Chen et al., 2005). Following the intention of the German Corporate Governance Code, the formation of an audit committee is seen as an indicator for board effectiveness. Therefore, the binary variable AC reflects whether the supervisory board adheres to the Governance Code and sets up an audit committee.

One major purpose of auditing is to monitor financial information provided by the management. Effective alignment of managerial with owners' interests can improve the accuracy of this information, thereby lowering the demand for audit services. Drawing on prior work of Vafeas/Waagelein (2007) and Gul et al. (2003) we include compensation aspects in our regression model, namely the ratio of variable bonus compensation to overall cash-based payment (MCRatio) and a dummy variable which indicates whether a stock option program exists (SOP).<sup>5</sup> Remuneration contracts could influence management behaviour in two ways: If compensation incentives induce managers to manipulate earnings in order to increase their accounting-based compensation, audit effort should increase as well. If market-based performance measures are adopted, earnings management could be used to affect capital market's perception of the companies' performance. However, as compensation contracts are designed to align managers' and shareholders' interests, compensation incentives could substitute external control. This might be a reasonable explanation for a negative relation between audit fees and performance-based remuneration. As evidence on the effects of management compensation on audit fees is still rare, it remains unclear which effect prevails.

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<sup>5</sup> There is only sporadic and diverse information on the fair value of stock options in the disclosed sample data. Therefore, we include a dummy variable as a rough indicator for long-term managerial incentives.

Table 4: Correlation Matrix

Pearson	LN(TA)	LN(SUB)	ROA	LEV	OWN25	BIG4	NAS	AC	MEET	MCRatio	SOP
LN(AF)	0.903**	0.820**	-0.130*	0.189**	-0.017	0.326**	0.276**	0.534**	-0.001	0.503**	0.189**
AF/TA	-	0.347**	0.381**	-0.542**	-0.051	-0.143*	-0.145*	-0.245**	0.075	-0.331**	0.020
LN(TA)	-	0.836**	-0.235**	0.113	0.014	0.301**	0.236**	0.553**	-0.027	0.553**	0.131*
LN(SUB)		-	-0.227**	0.254**	0.091	0.266**	0.173**	0.442**	-0.065	0.528**	0.098
ROA			-	-0.032	-0.023	-0.027	-0.078	-0.049	0.178**	-0.031	0.000
LEV				-	0.029	-0.046	-0.007	0.071	-0.033	-0.003	-0.004
OWN25					-	-0.040	0.000	-0.060	0.002	0.044	-0.023
BIG4						-	0.095	0.267**	0.010	0.201**	0.216**
NAS							-	0.173**	-0.006	0.184**	0.037
AC								-	0.051	0.157*	0.336**
MEET									-	0.099	0.107
MC Ratio										-	0.096
SOP											-

\* Significant at  $p < 0.05$  (two-tailed)

\*\* Significant at  $p < 0.01$  (two-tailed)

## 4 Results

The empirical analysis is based on the investigation approach described in section 3.2. Thus, we use two model specifications in order to identify the impact of governance characteristics on audit fees. For the first specification, the natural logarithm of audit fees is employed as the dependent variable, while the second model uses audit fees divided by total assets to abstract from size effects. Results from OLS regressions with robust standard errors are provided in table 5 and 6.

In the first model specification most of the audit fee variation is explained by variations of the independent variables as the adjusted  $R^2$  values are on a particular high level. The specification which includes industry dummies improves the goodness of fit.<sup>6</sup> It also dominates the specification without industry dummies according to the Akaike and the Schwartz criteria which are not reported in the table. Here, industry dummies indicate that chemical companies show significant structural differences leading to higher audit fees. In the second model several industries seem to have an impact on audit fees per assets. Similar to model (1), the specification including industry dummies dominates. Noticeable industry effects were found for retail, basic resources as well as software and technology companies. In line with Simunic's (1980) outcomes the general fit of this model is lower than the one of the first. Company size considerably contributes to the explanatory power of model (1). As model (2) abstracts from size effects, the explanatory power decreases. Nonetheless, adjusted  $R^2$  is still 0.690.

In the following, we jointly discuss the empirical findings of both models, as this allows more comprehensive insights into the functional interrelations between the dependent and the explanatory variables. In both model specifications the results on profitability ( $|ROA|$ ) indicate that significantly higher fees are paid by companies either having a particular high positive or negative return on assets. A closer look at the distribution of returns and audit fees reveals that high fees are actually paid in both cases, as hypothesized in section 3.2. On the one hand, these findings provide evidence that profitable companies ask for thorough audits to signal the enhanced reliability of their

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<sup>6</sup> We employ industry classification provided by the Deutsche Börse AG, using industrial companies as a base industry (Clatworthy/Peel, 2007).

<b>Model 1</b>						
Variables	Coefficient	t	P> t	Coefficient	t	P> t
Intercept	2.242	3.26	0.001	2.245	3.14	0.002
LN(TA) ( <i>Model 1</i> )	0.465	11.43	0.000	0.463	11.13	0.000
LN(SUB)	0.223	4.67	0.000	0.222	4.84	0.000
ROA	1.303	4.93	0.000	1.267	4.41	0.000
LEV	0.287	3.52	0.001	0.341	4.27	0.000
OWN25	-0.117	-1.64	0.102	-0.084	-1.19	0.233
BIG4	0.120	1.71	0.088	0.102	1.40	0.161
NAS	0.232	3.52	0.001	0.266	3.92	0.000
AC	0.070	0.84	0.400	0.105	1.25	0.211
MEET	0.004	0.24	0.808	-0.001	-0.08	0.933
MC Ratio	-0.193	-1.01	0.315	-0.173	-0.91	0.365
SOP	0.183	2.64	0.009	0.140	1.88	0.062
Automobile	-	-	-	-0.126	-0.45	0.655
Construction	-	-	-	0.009	0.03	0.976
Chemicals	-	-	-	0.498	2.68	0.008
Retail	-	-	-	-0.195	-1.49	0.139
Financial Services	-	-	-	-0.221	-1.35	0.178
Basic Resources	-	-	-	-0.037	-0.15	0.880
Consumer	-	-	-	-0.238	-1.14	0.257
Media	-	-	-	-0.085	-0.74	0.458
Pharma & Healthcare	-	-	-	0.143	1.09	0.275
Software	-	-	-	0.118	1.13	0.262
Technology	-	-	-	0.215	1.37	0.173
Telecommunication	-	-	-	0.245	1.35	0.179
Transport & Logistics	-	-	-	-0.299	-1.39	0.166
Utilities	-	-	-	0.471	0.77	0.444
Adj. $R^2$	0.856			0.870		
$F$ Statistic	81.33			54.53		
	N=266			N=266		

Table 5: OLS Regression Results Model 1

financial statements. On the other hand, high losses are an indicator for inherent risk which is reflected in increased audit fees. In line with previous studies (e.g. Francis, 1984; Carcello et al., 2002), model (1) yields highly significant results for client size and complexity, which seem to have a positive impact on audit fees. An increase in firm size by 10 percent leads to 4.63 percent higher fees. Regarding LN(SUB) in model (2), the sign of the coefficient changes. With respect to leverage, we could not predict the sign of the coefficient. Regardless of the model specification, our results suggest a significant positive impact of leverage on audit fees. Whereas these results differ from those in Niemi (2002) and Abbott et al. (2003a), we are in line with Carson et al.

<b>Model 2</b>						
Variables	Coefficient	t	P> t	Coefficient	t	P> t
Intercept	0.443	0.75	0.453	-0.119	-0.19	0.852
LN(SUB)	-0.575	-4.88	0.000	-0.556	-5.00	0.000
ROA	7.473	6.10	0.000	7.324	5.93	0.000
LEV	5.286	3.96	0.000	5.399	4.20	0.000
OWN25	-0.140	-0.82	0.411	-0.163	-0.97	0.334
BIG4	0.103	0.53	0.595	0.125	0.64	0.523
NAS	-0.122	-0.65	0.513	-0.002	-0.01	0.993
AC	-0.467	-2.62	0.009	-0.396	-2.10	0.037
MEET	-0.048	-1.24	0.216	-0.046	-1.05	0.297
MC Ratio	-1.197	-2.66	0.008	-1.080	-2.44	0.015
SOP	0.391	2.06	0.041	0.275	1.40	0.164
Automobile	-	-	-	-0.054	-0.18	0.855
Construction	-	-	-	0.699	1.39	0.167
Chemicals	-	-	-	0.235	0.93	0.354
Retail	-	-	-	0.772	2.07	0.040
Financial Services	-	-	-	0.055	0.16	0.871
Basic Resources	-	-	-	-1.194	-2.27	0.024
Consumer	-	-	-	0.297	1.13	0.259
Media	-	-	-	-0.171	-0.35	0.725
Pharma & Healthcare	-	-	-	0.437	1.16	0.247
Software	-	-	-	1.057	3.41	0.001
Technology	-	-	-	0.942	2.10	0.036
Telecommunication	-	-	-	0.151	0.65	0.517
Transport & Logistics	-	-	-	0.033	0.08	0.936
Utilities	-	-	-	0.288	0.42	0.677
Adj. $R^2$	0.656			0.690		
$F$ Statistic	12.48			6.77		
	N=266			N=266		

Total assets in thousand Euros.

Table 6: OLS Regression Results Model 2

(2004). Taking a demand-side perspective, creditors longing to achieve a higher level of transparency and quality in the annual statements could be an explanation for this finding. The results also suggest that leverage might be an indicator for increased risk of financial distress which should result in higher audit fees. We investigate the significance of OWN25 on audit fees as another client characteristic. Convincing evidence that concentrated ownership effectively influences audit fees cannot be found. As a sensitivity analysis, we alternatively included a binary variable indicating whether one shareholder holds more than fifty percent of the shares. This measure also turned out to be insignificant.

Concerning the auditor attributes (NAS and BIG4), the provision of non-audit services seems to have a significant impact on audit fees. According to the results of model (1), companies obtaining non-audit services from their auditor tend to pay higher audit fees. This is consistent with prior results in empirical literature (Firth, 1997; Ashbaugh et al., 2003). But findings for NAS alter between the model specifications. The size adjusted approach of model (2) does not support the relevance of NAS in explaining variations in the dependent variable. Model specifications using the value of nonaudit service fees (VNAS) instead of a binary variable are reported in table 7 in the appendix. Results from these specifications confirm that a significant positive effect of nonaudit services on audit fees can only be found in model (1). In contrast, results for BIG4 do not provide evidence for a significant interrelation with audit fees. The respective coefficient is only significant at the ten percent level in the first model specification, if industry dummies are not included. Thus, German data does not seem to support the hypothesis that either reputation effects or superior quality of BIG4 audits lead to higher audit fees. In contrast to a variety of prior studies (Craswell et al., 1995; Abbott et al., 2003a etc.), our results suggest that "Big 4" auditors in Germany do not realize higher overall fees.

In our analysis, governance characteristics are measured by proxies for the diligence and effectiveness of the supervisory board as well as by attributes of the management compensation. Results for the governance characteristics depend on the specification of the dependent variable. The second approach should allow to separate governance impacts from the predominant effect of company size on audit fees.

As expected due to the faint correlation between MEET and LN(AF) as well as AF/TA (see table 4) we find insignificant results for this variable. This finding could imply that there is no relation between diligence of the supervisory board and external control by the auditor. However, the number of meetings only imperfectly captures the quality of board's activities. The effectiveness of the supervisory board is proxied by a binary variable, indicating whether an audit committee (AC) has been established. For the second model, the respective coefficient shows a significant inverse relation between the existence of an audit committee and audit fees. As given in table 2, the expenses

for audits per 1000 € of assets are on average 1.49 €. Setting up an audit committee lowers these expenses by approximately 0.40 €. Thus, external monitoring seems to be substituted by effective internal control.

The measures MC Ratio and SOP represent managerial incentives arising from short- and long-term variable management compensation. While the coefficient for MC Ratio shows no significant result in model (1), there is strong empirical evidence for a negative impact of an increasing ratio of short-term bonus payments in a size-adjusted setting. This result could be due to effective alignment of interests as outlined in section 2. In case of successful alignment, compensation incentives substitute for external monitoring. The positive estimator for SOP indicates that companies with a stock option program in place tend to pay higher audit fees. However, this significant effect vanishes after allowing for differences between industries in model (2). One reason for this finding might be the increasing audit effort caused by the complex design of stock option programs.

In addition, modifications of the respective regression models, e.g. including additional variables like the remuneration of the audit committee or management retention in D&O insurances did not substantially change the regression coefficients or their significance levels. Using turnover instead of total assets as a measure for company size did not change the main results either, but the goodness of fit declined.

## 5 Conclusion

This study represents a first attempt to study the relation between audit fees, client, auditor and governance attributes in Germany. As there are differences in governance regimes, such as two-tier and one-tier board structures, we investigate whether results of former studies that analyzed the influence of client, auditor and governance attributes on audit fees do also hold for a German setting. To our knowledge, no prior study used German data on audit fees, management compensation and characteristics of the supervisory board to examine the link between corporate governance and auditing. Methodologically, our work builds on Simunic (1980) and subsequent audit fee regression models to explain variation in audit fees. However, the regression models adopt and modify recent approaches that included governance characteristics. In line with prior research we consistently find that client attributes as size, profitability and leverage positively influence audit fees. In contrast, our results regarding auditor and governance aspects are sensitive to the regression model in use. Controlling for size effects on audit fees, we find that management incentives in terms of short term performance based compensation negatively influence audit fees. Insofar, our results are partly consistent with the findings of Vafeas/Waagelein (2007).

Of course, this study is subject to some limitations. We could only employ cross-sectional analysis as information on management compensation has not been provided by the companies before 2006. Nevertheless, this study adds to the literature on governance and auditing and provides insights on interdependencies between governance structures and audit fees. Further research on these interdependencies considering international differences in governance regimes could enhance our understanding of corporate control.

## A Appendix

Variables	Model 1			Model 2		
	Coefficient	t	P> t	Coefficient	t	P> t
Intercept	2.515	3.62	0.000	-0.384	-0.62	0.536
LN(TA)	0.446	11.10	0.000	-	-	-
LN(SUB)	0.222	4.89	0.000	-0.522	-4.43	0.000
ROA	1.287	4.50	0.000	7.097	5.71	0.000
LEV	0.328	4.14	0.000	5.396	4.08	0.000
OWN25	-0.075	-1.10	0.273	-0.135	-0.81	0.416
BIG4	0.099	1.37	0.172	0.094	0.48	0.630
LN (NAS)	0.031	4.96	0.000	-	-	-
VNAS/TA (€ 000s)	-	-	-	0.129	1.10	0.273
AC	0.110	1.33	0.184	-0.406	-2.16	0.032
MEET	-0.003	-0.19	0.852	-0.037	-0.85	0.396
MC Ratio	-0.166	-0.89	0.376	-1.027	-2.39	0.017
SOP	0.132	1.81	0.072	0.288	1.49	0.139
Automobile	-0.114	-0.42	0.676	0.006	0.02	0.984
Construction	0.026	0.09	0.925	0.715	1.39	0.165
Chemicals	0.476	2.74	0.007	0.205	0.78	0.433
Retail	-0.178	-1.34	0.183	0.794	2.11	0.036
Financial Services	-0.213	-1.33	0.185	0.098	0.29	0.769
Basic Resources	-0.030	-0.12	0.905	-1.058	-2.01	0.046
Consumer	-0.220	-1.06	0.289	0.357	1.36	0.174
Media	-0.083	-0.73	0.469	-0.142	-0.30	0.765
Pharma & Healthcare	0.156	1.23	0.221	0.489	1.33	0.183
Software	0.130	1.24	0.215	1.041	3.49	0.001
Technology	0.242	1.56	0.120	1.020	2.32	0.021
Telecommunication	0.245	1.42	0.157	0.205	0.91	0.364
Transport & Logistics	-0.328	-1.52	0.129	0.062	0.15	0.881
Utilities	0.488	0.81	0.419	0.308	0.45	0.652
Adj. $R^2$	0.874			0.695		
$F$ Statistic	58.36			7.52		
	N=266			N=266		

Table 7: OLS Regression Results of Model 1 and 2 including the value of NAS

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