# Finanzwirtschaftliche Entscheidungen auf Basis agencytheoretischer Überlegungen

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## Inhaltsübersicht

# Teil 1: Thematische Einordung der Forschungsbeiträge

## Inhaltsübersicht

## 1.1 Übersicht über die Forschungsbeiträge

Die vorliegende Dissertationsschrift besteht aus vier Einzelbeiträgen. Tabelle 1 enthält eine Übersicht über die Einzelbeiträge sowie Angaben über mitwirkende Ko-Autoren und Informationen zur Veröffentlichung.

## Tabelle 1: Übersicht über die Forschungsbeiträge

| Titel | Ko-Autoren | Eigenanteil | Zeitschrift |
|---|---|---|---|
| Ownership Structure and the Analysts' Information Environment: Direct and Mediated Associations | - | 100% | - |
| Foreign Ownership and Audit Fees: Does the Legal Origin of the Foreign Owner and the Firm Matter? | - | 100% | - |
| Eigenkapitalbeteiligungen des Managements und die Performance börsennotierter Unternehmen - Eine empirische Analyse für den deutschen Aktienmarkt | - | 100% | Corporate Finance 2014 (Heft 07-08), 309-314 |
| The Impact of External and Internal Corporate Governance Mechanisms on Agency Costs | - | 100% | - |

## 1.2 Thematischer Zusammenhang der Forschungsbeiträge

Die Trennung von Eigentum und Kontrolle ist ein wesentliches Merkmal börsennotierter Unternehmen. Die Übertragung der Verantwortung für die Leitung des Unternehmens durch den Eigentümer auf den angestellten Manager führt dabei nicht selten zu dem in der Wirtschaftswissenschaft bekannten Prinzipal-Agent-Problem (Jensen und Meckling 1976). Aus dem Prinzipal-Agent-Problem erwachsende Auswirkungen auf finanzwirtschaftliche Entscheidungen ausgewählter Marktteilnehmer sowie die Untersuchung geeigneter Maßnahmen zur Lösung dieses Problems ist Gegenstand der im Rahmen dieser Dissertation verfassten Einzelbeiträge.

## 1.3 Forschungsfragen der Einzelbeiträge

### Ownership Structure and the Analysts' Information Environment: Direct and Mediated Associations

Der vorliegende Beitrag untersucht den Zusammenhang zwischen der Eigentümerstruktur von Unternehmen und dem Informationsumfeld von Finanzanalysten. Weiter geht der Beitrag der Frage nach, inwieweit dieser Zusammenhang durch das Informationsumfeld von Unternehmen beeinflusst wird.

Die Eigentümerstruktur von Unternehmen stellt nach Jensen und Meckling (1976) eine geeignete Maßgröße zur Bestimmung von Agency-Problemen dar. Sie bestimmt den Umfang der Überwachung des Managements und dadurch das Ausmaß und die Qualität der vom Management zur Verfügung gestellten Finanzinformationen (Eng und Mak 2003).[1] Finanzanalysten sammeln und verarbeiten diese Finanzinformationen und verbreiten sie anschließend in Form von Gewinnprognosen und Kauf- und Verkauf-Empfehlungen an Investoren und andere Marktteilnehmer (Lang und Lundholm 1996). Vor dem Hintergrund dieser Wechselbeziehung untersucht der vorliegende Beitrag den Zusammenhang zwischen der Eigentümerstruktur von Unternehmen und dem Informationsumfeld von Finanzanalysten. Bisherige Beiträge untersuchen diesen Zusammenhang vorwiegend im angloamerikanischen Raum (Bhushan 1989; Parkash et al. 1995; Lang et al. 2004; Haw et al. 2010). Den Beiträgen ist gemeinsam, dass sie den Zusammenhang zwischen der Eigentümerstruktur von Unternehmen und dem Informationsumfeld von Finanzanalysten auf die der Eigentümerstruktur immanenten Agency-Probleme und der daraus erwachsenden Güte des Informationsumfeldes von Unternehmen zurückführen. Eine Untersuchung dieser Wechselbeziehung erfolgt indes nicht.

Der vorliegende Beitrag schließt diese Forschungslücke, indem untersucht wird, inwieweit diese Wechselbeziehung tatsächlich beobachtbar ist. Dafür wird vereinfachend angenommen, dass sich das Informationsumfeld von Unternehmen in zwei das Informationsumfeld von Finanzanalysten beeinflussende Komponenten unterteilen lässt: (1) die Qualität der jährlich zur Verfügung gestellten

[1] Zahlreiche Studien haben gezeigt, dass es einen Zusammenhang zwischen der Eigentümerstruktur von Unternehmen und dessen Informationsumfeld gibt (Ruland et al. 1990; Healy et al. 1999; Eng und Mak 2003; Wang 2006; Ali et al. 2007; Chen et al. 2008).

Rechnungslegungsinformationen und (2) „andere“ von dem Unternehmen zur Verfügung gestellten Informationen. Anschließend wird untersucht, ob der Einfluss der Eigentümerstruktur von Unternehmen auf das Informationsumfeld von Finanzanalysten auf einen indirekten Effekt (vermittelt durch die Qualität der jährlich zur Verfügung gestellten Rechnungslegungsinformationen) zurückzuführen ist oder vielmehr einem direkten Effekt (aufgrund eines durch „andere“ Informationen verbesserten Informationsumfeldes von Unternehmen) zuzuordnen ist.

Ausgehend von einer Stichprobe von 256 börsennotierten Unternehmen über einen Zeitraum von fünf Jahren (2006 bis 2010) zeigen die Ergebnisse des vorliegenden Beitrags einen positiven direkten Effekt der Eigentümerstruktur von Unternehmen auf das Informationsumfeld von Finanzanalysten, wenn mit der Leitung des Unternehmens betraute Personen oder Banken einen wesentlichen Anteil am Eigenkapital des Unternehmens halten. Die Ergebnisse zeigen weiter, dass die Qualität der jährlich zur Verfügung gestellten Rechnungslegungsinformationen einen positiven Einfluss auf das Informationsumfeld von Finanzanalysten hat. Für Unternehmen, bei denen Banken einen wesentlichen Anteil am Eigenkapital des Unternehmens halten, kann schließlich ein negativer indirekter Effekt der Eigentümerstruktur von Unternehmen auf das Informationsumfeld von Finanzanalysten nachgewiesen werden.

**Foreign Ownership and Audit Fees: Does the Legal Origin of the Foreign Owner and the Firm Matter?**

Der vorliegende Beitrag untersucht den Zusammenhang zwischen Eigenkapitalbeteiligungen ausländischer Investoren und der Höhe von Prüfungshonoraren. Weiter geht der Beitrag der Frage nach, inwieweit dieser Zusammenhang durch das in dem Herkunftsland des ausländischen Investors und/oder der Beteiligung vorherrschenden, die Stärke des Anlegerschutzes kennzeichnenden Rechtssystem beeinflusst wird.

Die Jahresabschlussprüfung durch den externen Abschlussprüfer stellt nach Jensen und Meckling (1976) ein wichtiges Instrument zur Reduzierung von Agency-Problemen zwischen dem Management und den am Eigenkapital des Unternehmens beteiligten Investoren dar. Die Agency-Probleme werden verstärkt, wenn ausländische Investoren am Eigenkapital des Unternehmens beteiligt sind. Dies ist im Wesentlichen durch die

physische Distanz des ausländischen Investors zum Sitz der Beteiligung und seiner damit in Verbindung stehenden eingeschränkten Überwachungsmöglichkeit begründet.[2] Ausländischen Investoren wird daher eine erhöhte Abhängigkeit von der Jahresabschlussprüfung zuteil, die es ihnen ermöglicht die Glaubwürdigkeit bzw. Verlässlichkeit der rechnungslegungsbasierten Informationen sicherzustellen. Vor diesem Hintergrund ist die erste Zielsetzung des vorliegenden Beitrags die Untersuchung des Zusammenhangs zwischen Eigenkapitalbeteiligungen ausländischer Investoren und der Höhe von Prüfungshonoraren.

Vergangene Studien haben gezeigt, dass das Verhalten von Investoren und Abschlussprüfern von dem vorherrschenden, die Stärke des Anlegerschutzes kennzeichnenden Rechtssystem beeinflusst wird. (Shleifer und Vishny 1997; Francis et al. 2003; Choi und Wong 2007; Choi et al. 2008; Francis und Wang 2008; Choi et al. 2009). So konnte nachgewiesen werden, dass Länder mit einem starken Anlegerschutz tendenziell höhere Prüfungshonorare aufweisen als Länder, die durch einen verhältnismäßig schwachen Anlegerschutz gekennzeichnet sind (Francis et al. 2003; Choi et al. 2008). Eine Untersuchung des Zusammenhangs zwischen Eigenkapitalbeteiligungen ausländischer Investoren und der Höhe von Prüfungshonoraren unter Berücksichtigung des Anlegerschutzes erfolgte indes nicht. Die zweite Zielsetzung des vorliegenden Beitrags ist diese Forschungslücke zu schließen, indem untersucht wird, inwieweit dieser Zusammenhang durch das in dem Herkunftsland des ausländischen Investors und/oder der Beteiligung vorherrschenden, die Stärke des Anlegerschutzes kennzeichnenden Rechtssystem beeinflusst wird.

Ausgehend von einer Stichprobe von 1.697 börsennotierten Unternehmen über einen Zeitraum von acht Jahren (2005 bis 2012) zeigen die Ergebnisse des vorliegenden Beitrags einen positiven Zusammenhang zwischen Eigenkapitalbeteiligungen ausländischer Investoren und der Höhe von Prüfungshonoraren. Die Ergebnisse zeigen weiter, dass der positive Zusammenhang im Wesentlichen auf ausländische Investoren zurückzuführen ist, deren Herkunftsländer durch einen starken Anlegerschutz gekennzeichnet sind. Hinsichtlich der Frage, ob die Stärke des Anlegerschutzes von dem Herkunftsland der Beteiligung ebenfalls einen Einfluss auf den Zusammenhang

[2] Zahlreiche Studien haben in diesem Zusammenhang gezeigt, dass ausländische Investoren einen Informationsnachteil gegenüber inländischen Investoren haben (Brennan und Cao 1997; Kang und Stulz 1997, Choe et al. 2005; Leuz et al. 2009, Kang und Kim 2010; Choi et al. 2013).

zwischen ausländischen Eigenkapitalbeteiligungen und der Höhe von Prüfungshonoraren hat, kann der vorliegende Beitrag indes keinen eindeutigen Nachweis erbringen.

**Eigenkapitalbeteiligungen des Managements und die Performance börsennotierter Unternehmen – Eine empirische Analyse für den deutschen Aktienmarkt**

Der vorliegende Beitrag untersucht den Zusammenhang zwischen Eigenkapitalbeteiligungen des Managements und der Performance börsennotierter Unternehmen.

Die aktive Beteiligung des Managements am Eigenkapital des Unternehmens stellt nach Jensen und Meckling (1976) ein geeignetes Mittel zur Interessenharmonisierung von Manager und Aktionär dar. Obwohl die aktive Beteiligung des Managements am Eigenkapital des Unternehmens bisher vorwiegend im angloamerikanischen Raum umgesetzt wird, ist seit jüngerer Zeit auch in Deutschland ein entsprechender Trend erkennbar. Ursache für diesen Trend ist unter anderem das am 05.08.2009 durch die Bundesregierung verabschiedete Gesetz zur Angemessenheit der Vorstandsvergütung (VorstAG) und die darin enthaltene Forderung nach einer auf eine nachhaltige Unternehmensentwicklung ausgerichteten Vergütungsstruktur (§ 87 Abs. 1 Satz 2 AktG). Ob eine Eigenkapitalbeteiligung des Managements zu einer Verbesserung der Unternehmensperformance führt und somit die gewünschte Interessenharmonisierung zwischen Manager und Aktionär mit sich bringt ist Gegenstand des vorliegenden Beitrags. Die bisherige, vornehmlich internationale Literatur zeigt grundsätzlich einen positiven Zusammenhang zwischen am Eigenkapital beteiligten Managern und der Performance ihrer Unternehmen.[3] In Deutschland ist diesem Forschungsschwerpunkt bisher kaum Aufmerksamkeit geschenkt worden.[4]

Vor diesem Hintergrund untersucht der vorliegende Beitrag die Konsequenzen von Eigenkapitalbeteiligungen des Managements auf die Performance von Unternehmen für den deutschen Aktienmarkt. Dadurch wird nicht nur die Forschungslücke für den

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[3] Siehe hierzu stellvertretend für viele: Morck et al. (1988); Short und Keasey (1999); Adams und Santos (2006); Benson und Davidson (2009).

[4] Eine empirische Untersuchung des Einflusses von Eigenkapitalbeteiligungen des Managements auf die Unternehmensperformance für die Jahre 1998 und 2003 in Deutschland liefert Kaserer und Moldenhauer (2008).

deutschsprachigen Raum geschlossen, sondern auch wichtige Erkenntnisse zu einer gesellschaftlich relevanten Fragestellung beigetragen.[5]

Ausgehend von einer Stichprobe von 210 börsennotierten Unternehmen über einen Zeitraum von sechs Jahren (2005 bis 2010) zeigen die Ergebnisse des vorliegenden Beitrags einen positiven Zusammenhang zwischen Eigenkapitalbeteiligungen des Managements und der Unternehmensperformance. Insgesamt lassen die Ergebnisse den Schluss zu, dass Eigenkapitalbeteiligungen des Managements ein wirkungsvolles Instrument zu sein scheinen eine Interessenharmonisierung zwischen Manager und Aktionär herbeizuführen. Vor diesem Hintergrund wäre es wünschenswert, wenn die durch die Bundesregierung am 05.08.2009 formulierte und im VorstAG festgehaltene Forderung nach einer auf eine nachhaltige Unternehmensentwicklung ausgerichteten Vergütungsstruktur in dieser Form weiter nachgekommen wird.

**The Impact of External and Internal Corporate Governance Mechanisms on Agency Costs**

Unter Anwendung der stochastischen Effizienzgrenzanalyse (SFA) zur Schätzung unternehmensindividueller Agency-Kosten untersucht der vorliegende Beitrag den Zusammenhang zwischen externen und internen Corporate-Governance-Mechanismen und Agency-Kosten.

Agency-Kosten – resultierend aus der Trennung von Eigentum und Kontrolle als wesentliches Merkmal börsennotierter Unternehmen – erfreuen sich seit der Arbeit von Jensen und Meckling (1976) einem großen wissenschaftlichen Interesse. Dennoch, hinsichtlich der geeigneten Messung derer besteht in der aktuellen empirischen Wirtschaftsforschung weiterhin Uneinigkeit. Ein Großteil der bisherigen Forschung

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[5] Zur öffentlichen Diskussion hinsichtlich einer adäquaten Gestaltung der Managementvergütung zur Herbeiführung einer Interessenharmonisierung zwischen Manager und Aktionär, vgl. stellvertretend für viele, Manager Magazin Online (2009): Gedeckelte Manager, abrufbar unter http://www.manager-magazin.de/magazin/artikel/a-627530.html, abgerufen am 07.03.2016; Handelsblatt Online (2009): „Wer verdient sein Geld, wer bekommt es nur?“, abrufbar unter http://www.handelsblatt.com/karriere/nachrichten/studie-zu-managergehaeltern-wer-verdient-sein-geld-wer-bekommt-es-nur/3023996.html, abgerufen am 07.03.2016; Spiegel Online (2009): Finanzexperten plädieren für strengere Bonus-Regeln, abrufbar unter http://www.spiegel.de/wirtschaft/soziales/umfrage-finanzexperten-plaedieren-fuer-strengere-bonus-regeln-a-650826.html, abgerufen am 07.03.2016; Handelsblatt Online (2014): So entsteht das Millionengehalt eines Topmanagers, abrufbar unter http://www.handelsblatt.com/unternehmen/management/gerechter-lohn-so-entsteht-das-millionengehalt-eines-topmanagers/10338328.html, abgerufen am 07.03.2016.

verwendet vereinfachend Performance-Maße zur Messung von Agency-Kosten.[6] Dies führt häufig zu uneinheitlichen und dementsprechend schwer interpretierbaren Ergebnissen (Renders und Gaeremynck 2006; Larcker et al. 2007; Dey 2008; Bozec et al. 2010). Vor diesem Hintergrund begannen jüngere Studien unter Anwendung der SFA differenziertere Maße für das Ausmaß von Agency-Kosten zu entwickeln (z.B., Habib und Ljungqvist 2005). Der vorliegende Beitrag folgt diesem Ansatz und untersucht den Zusammenhang zwischen externen und internen Corporate-Governance-Mechanismen und Agency-Kosten. Während vergangene Studien unter Anwendung der SFA im Wesentlichen interne Corporate-Governance-Mechanismen betrachten (z.B., Habib und Ljungqvist 2005), bleibt eine entsprechende Untersuchung externer Corporate-Governance-Mechanismen weitgehend unberücksichtigt.

Unter Anwendung der SFA zur Messung unternehmensindividueller Agency-Kosten schließt der vorliegende Beitrag diese Forschungslücke, indem untersucht wird, inwieweit neben internen Corporate Governance-Mechanismen auch externe Corporate-Governance-Mechanismen die Agency-Kosten eines Unternehmens beeinflussen.

Ausgehend von einer Stichprobe von 313 börsennotierten Unternehmen über einen Zeitraum von sechs Jahren (2006 bis 2011) zeigen die Ergebnisse des vorliegenden Beitrags, dass branchenspezialisierte Wirtschaftsprüfungsgesellschaften, die „*Big-Five*-Wirtschaftsprüfungsgesellschaften“ (*KPMG, PwC, Deloitte, Ernst & Young und BDO*) sowie die Höhe geleisteter Prüfungshonorare als externe Corporate-Governance-Mechanismen geeignet sind, die Agency-Kosten eines Unternehmens zu reduzieren. Darüber hinaus bestätigt der vorliegende Beitrag hinsichtlich der internen Corporate-Governance-Mechanismen die Ergebnisse bisheriger Studien. So kann gezeigt werden, dass die Incentivierung des Managements, im Wesentlichen durch die Implementierung erfolgsabhängiger Vergütungsstrukturen sowie die Eigenkapitalbeteiligung des Managements, ebenfalls geeignet ist eine Reduzierung der Agency-Kosten herbeizuführen. Lediglich die Implementierung eines Prüfungsausschusses scheint entsprechend der Ergebnisse des vorliegenden Beitrags keinen Einfluss auf die Agency-Kosten eines Unternehmens zu haben.

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[6] Häufig verwendete Performance-Maße sind in diesem Zusammenhang Tobin’s Q, die Anlagenrendite oder der Börsenkurs (z.B., Mehran 1995; Cole und Mehran 1998; Himmelberg et al. 1999), die Aufwandsquote und die Sachanlagenbindung (z.B., Ang et al. 2000; Singh und Davidson 2003; Florackis 2008) oder die Umschlagshäufigkeit des Gesamtkapitals (z.B., Florackis 2008; Florackis und Ozkan 2009).

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## 1.5 Zusammenfassung

Bei der vorliegenden Arbeit handelt es sich um eine kumulative Dissertation, welche sich aus vier Einzelbeiträgen zusammensetzt. Aus dem Prinzipal-Agent-Problem erwachsende Auswirkungen auf finanzwirtschaftliche Entscheidungen ausgewählter Marktteilnehmer sowie die Untersuchung geeigneter Maßnahmen zur Lösung dieses Problems bilden den zentralen Forschungsrahmen dieser Einzelbeiträge.

Der erste Beitrag untersucht den Zusammenhang zwischen der Eigentümerstruktur von Unternehmen und dem Informationsumfeld von Finanzanalysten. Weiter geht der Beitrag der Frage nach, inwieweit dieser Zusammenhang durch das Informationsumfeld von Unternehmen beeinflusst wird. Ausgehend von einer Stichprobe von 256 börsennotierten Unternehmen über einen Zeitraum von fünf Jahren (2006 bis 2010) zeigen die Ergebnisse des vorliegenden Beitrags einen positiven direkten Effekt der Eigentümerstruktur von Unternehmen auf das Informationsumfeld von Finanzanalysten, wenn mit der Leitung des Unternehmens betraute Personen oder Banken einen wesentlichen Anteil am Eigenkapital des Unternehmens halten. Die Ergebnisse zeigen weiter, dass die Qualität der jährlich zur Verfügung gestellten Rechnungslegungsinformationen einen positiven Einfluss auf das Informationsumfeld von Finanzanalysten hat. Für Unternehmen, bei denen Banken einen wesentlichen Anteil am Eigenkapital des Unternehmens halten, kann schließlich ein negativer indirekter Effekt der Eigentümerstruktur von Unternehmen auf das Informationsumfeld von Finanzanalysten nachgewiesen werden.

Der zweite Beitrag untersucht den Zusammenhang zwischen Eigenkapitalbeteiligungen ausländischer Investoren und der Höhe von Prüfungshonoraren. Weiter geht der Beitrag der Frage nach, inwieweit dieser Zusammenhang durch das in dem Herkunftsland des ausländischen Investors und/oder der Beteiligung vorherrschenden, die Stärke des Anlegerschutzes kennzeichnenden Rechtssystem beeinflusst wird. Ausgehend von einer Stichprobe von 1.697 börsennotierten Unternehmen über einen Zeitraum von acht Jahren (2005 bis 2012) zeigen die Ergebnisse des vorliegenden Beitrags einen positiven Zusammenhang zwischen Eigenkapitalbeteiligungen ausländischer Investoren und der Höhe von Prüfungshonoraren. Die Ergebnisse zeigen weiter, dass der positive Zusammenhang im Wesentlichen auf ausländische Investoren zurückzuführen ist, deren Herkunftsländer durch einen starken Anlegerschutz gekennzeichnet sind. Hinsichtlich

der Frage, ob die Stärke des Anlegerschutzes von dem Herkunftsland der Beteiligung ebenfalls einen Einfluss auf den Zusammenhang zwischen ausländischen Eigenkapitalbeteiligungen und der Höhe von Prüfungshonoraren hat, kann der vorliegende Beitrag indes keinen eindeutigen Nachweis erbringen.

Der dritte Beitrag untersucht den Zusammenhang zwischen Eigenkapitalbeteiligungen des Managements und der Performance börsennotierter Unternehmen. Ausgehend von einer Stichprobe von 210 börsennotierten Unternehmen über einen Zeitraum von sechs Jahren (2005 bis 2010) zeigen die Ergebnisse des vorliegenden Beitrags einen positiven Zusammenhang zwischen Eigenkapitalbeteiligungen des Managements und der Unternehmensperformance. Insgesamt lassen die Ergebnisse den Schluss zu, dass Eigenkapitalbeteiligungen des Managements ein wirkungsvolles Instrument zu sein scheinen eine Interessenharmonisierung zwischen Manager und Aktionär herbeizuführen.

Der vierte Beitrag untersucht unter Anwendung der stochastischen Effizienzgrenzanalyse (SFA) zur Schätzung unternehmensindividueller Agency-Kosten den Zusammenhang zwischen externen und internen Corporate-Governance-Mechanismen und Agency-Kosten. Ausgehend von einer Stichprobe von 313 börsennotierten Unternehmen über einen Zeitraum von sechs Jahren (2006 bis 2011) zeigen die Ergebnisse des vorliegenden Beitrags, dass branchenspezialisierte Wirtschaftsprüfungsgesellschaften, die „*Big-Five*-Wirtschaftsprüfungsgesellschaften“ (*KPMG, PwC, Deloitte, Ernst & Young und BDO*) sowie die Höhe geleisteter Prüfungshonorare als externe Corporate-Governance-Mechanismen geeignet sind, die Agency-Kosten eines Unternehmens zu reduzieren. Darüber hinaus bestätigt der vorliegende Beitrag hinsichtlich der internen Corporate-Governance-Mechanismen die Ergebnisse bisheriger Studien. So kann gezeigt werden, dass die Incentivierung des Managements, im Wesentlichen durch die Implementierung erfolgsabhängiger Vergütungsstrukturen, ebenfalls geeignet ist eine Reduzierung der Agency-Kosten herbeizuführen. Lediglich die Implementierung eines Prüfungsausschusses scheint entsprechend der Ergebnisse des vorliegenden Beitrags keinen Einfluss auf die Agency-Kosten eines Unternehmens zu haben.

## 1.6 Summary

This cumulative doctoral dissertation thesis consists of four studies. The main research of all studies is about agency problems and their impact on financial decisions. Further it deals with the question what mechanisms are appropriate to resolve those problems.

The first study investigates the effect of ownership structure on the analysts' information environment based on a sample of German-listed firms from 2006-2010. Differentiating between four ownership types (managerial, family, institutional, and bank ownership), the results show that managerial ownership and bank ownership shape a firm's information environment, in turn, positively affecting the forecast accuracy of financial analysts. This suggests that it is easier for financial analysts to provide more accurate forecasts to investors when managers or banks hold substantial shares of equity in a firm. Further analyses reveal that the quality of accounting numbers endogenously moderates the relationship between the analysts' information environment and ownership structure.

The second study investigates whether foreign ownership affects audit fees by analyzing shareholdings of the biggest individual foreign owners in firms from ten European countries (Austria, Belgium, Denmark, Germany, Ireland, Italy, the Netherlands, Norway, Spain, and the United Kingdom) from 2005-2012. The results show that foreign ownership is positively associated with audit fees. This is consistent with the notion that foreign owners are at an information disadvantage and are, therefore, willing to pay higher audit fees for increased audit effort in order to increase the reliability of the firm's financial numbers. The results also show that the positive association between foreign ownership and audit fees is driven by the quality of the shareholder protection system of the biggest individual foreign owner's home country (i.e., common-law vs. civil-law origin). In fact, the positive association between foreign ownership and audit fees is mainly driven by foreign owners from countries with strong shareholder protection. I find, however, no clear evidence suggesting that the quality of the shareholder protection system of the country in which the firm is located also shapes the relationship between foreign ownership and audit fees.

The third study investigates the effect of managerial ownership on firm performance based on a sample of German-listed firms from 2005-2010. The separation of ownership

and control is a fundamental attribute of German listed firms which often leads to the well-known agency problems. From a theoretical view, managerial ownership is an appropriate instrument to solve these problems. The paper at hands confirms that relationship by providing evidence for a positive association between managerial ownership and firm performance.

The fourth study applies statistical frontier analysis, a relatively new approach to estimate agency costs, and examines its association with internal and external corporate governance mechanisms. The results indicate that an industry specialized audit firm, the presence of a large audit firm, abnormal audit fees, management ownership, and variable management compensation are significantly negatively associated with the level of a firm's agency costs. In contrast, this seems not to be true for the existence of an audit committee for which my empirical evidence documents a non-significant association. In conclusion, I am able to contribute to the literature by documenting that quality-differentiated audits are an effective external corporate governance mechanism which reduces agency problems beyond internal corporate governance mechanisms, and thus, serve an important economic function.

# Teil 2: Ownership Structure and the Analysts' Information Environment:

# Direct and Mediated Associations


**SUMMARY**

This paper investigates the effect of ownership structure on the analysts' information environment based on a sample of German-listed firms from 2006-2010. Differentiating between four ownership types (managerial, family, institutional, and bank), the results show that managerial ownership and bank ownership shape a firm's information environment, in turn, positively affecting the forecast accuracy of financial analysts. This suggests that it is easier for financial analysts to provide more accurate forecasts to investors when managers or banks hold substantial shares of equity in a firm. Further analyses reveal that the quality of accounting numbers endogenously moderates the relationship between the analysts' information environment and ownership structure.

## Contents

# 1 Introduction

The separation of management and ownership in public firms makes it necessary to delegate competence, responsibilities, and decision-making power. This feature of public firms ultimately resembles a classical agency relationship, which often leads to agency problems. A firm's information environment develops endogenously as a consequence of these agency problems (Beyer et al. 2010). Jensen and Meckling (1976) assert that a firm's ownership structure determines the agency problems. Accordingly, several studies demonstrate an association between a firm's ownership structure and its information environment (Ruland et al. 1990; Warfield et al. 1995; Healy et al. 1999; Gabrielsen et al. 2002; Eng and Mak 2003; Velury and Jenkins 2006; Wang 2006; Ali et al. 2007; Chen et al. 2008).

Financial analysts play an important role in capital markets. They collect and process information and disseminate it in the form of earnings forecasts, buy/sell recommendations, and other information to brokers, money managers, and other investors (Lang and Lundholm 1996). Because firms provide a large part of information used by financial analysts, it is expected that firm characteristics (i.e., a firm's ownership structure) that affect its information environment also influence the analysts' information environment.[1] Several studies support this view by providing evidence for an association between a firm's ownership structure and the analysts' information environment (Bhushan 1989; Parkash et al. 1995; Lang et al. 2004; Boubaker and Labégorre 2008; Haw et al. 2010; García-Meca and Sánchez-Ballesta 2011). From a theoretical point of view, all these studies generally attribute the effect of ownership structure on the analysts' information environment to the inherent agency problems and

[1] There is broad evidence that the analysts' information environment is positively associated with the quality of a firm's information environment (Lang and Lundholm 1996; Healy et al. 1999; Francis et al. 1997; Basu et al. 1998; Bradshaw et al. 2001; Bowen et al. 2002; Abarbanell and Lehavy 2003; Hope 2003a; Hope 2003b; Bushman et al. 2004).

the resultant quality of a firm's information environment. Nevertheless, these studies fail to investigate the particular underlying mechanism.

Against this background, this paper explores the direct and indirect effects of ownership structure on the analysts' information environment. To this end, I undertake a simplistic classification of a firm's information environment, suggesting that a firm's information environment can be divided into two main components: (1) a quality component, which I define as the quality of a firm's accounting numbers, denoted by "accounting quality" and (2) a component consisting of other information provided by a firm that potentially influences the analysts' information environment, denoted by "other information". Subsequently, I examine if the overall effect of ownership structure on the analysts' information environment is either attributable to an improved information environment of firms due to an indirect effect (mediated by accounting quality) or rather to a direct effect, which I hypothesize to be attributable to an improved information environment of firms due to "other information".

Using a sample of German-listed firms from 2006-2010 and differentiating between four ownership types (managerial, family, institutional, and bank), I find evidence that managerial ownership and bank ownership positively and directly affect the analysts' information environment. Thus, it is easier for financial analysts to provide more accurate forecasts to investors when managers or banks hold a significant portion of the company shares. I also find that accounting quality is significantly positively associated with the analysts' information environment. This finding confirms the assumption of previous studies on the effect of ownership structure on the analysts' information environment and suggests that the quality of analysts' forecasts strongly depends on the quality of a firm's information environment. Only for bank ownership, I

find statistically robust evidence of an indirect effect (mediated by accounting quality) on the analysts' information environment.

My findings add evidence to the literature in several ways. First, I show how four ownership types affect the analysts' information environment, therefore highlighting the importance of a firm's ownership structure in explaining analysts' forecasts. Second, from a theoretical point of view, prior studies attribute the effect of ownership structure on the analysts' information environment to the inherent agency problems and the resultant quality of a firm's information environment. Nevertheless, by examining an undifferentiated overall effect they do not investigate how that mechanism ultimately operates. In contrast, my study is to the best of my knowledge the first to explore how a firm's ownership structure affects its information environment as well as how a firm's ownership structure and its information environment ultimately shape the analysts' information environment. Third, prior research has primarily focused on the market-based economy of the U.S., which is characterized by strong shareholder protection and highly dispersed shareholdings among many institutional and individual investors. My study is to the best of my knowledge the first to thoroughly analyze the effect of ownership structure on the analysts' information environment in Germany. The conditions of the German capital market differ considerably from those in the U.S. Referring to the studies of La Porta et al. (1997; 1998) Germany is characterized by low protection of outside investors, low importance of the equity market, and high ownership concentration. It has been shown that these institutional characteristics result in poor quality financial reporting due to increased agency problems between outside investors and controlling insiders (Leuz et al. 2003). I contribute to the existing literature by examining how a firm's ownership structure affects the analysts' information environment in a novel institutional context.

The remainder of the paper is organized as follows: Section 2 discusses theory and develops the research hypotheses; Section 3 sets up the research design; Section 4 discusses the sample composition and presents the empirical results; Section 5 summarizes my conclusion and reflects on the limitations of my research design.

## 2 Theory and Hypotheses

Prior literature provides evidence that a firm's ownership structure is associated with the analysts' information environment. Bhushan (1989) was the first to show that analyst following is associated with ownership structure. The author shows that analyst following is positively associated with institutional ownership and negatively associated with the percentage of shares held by insiders. Parkash et al. (1995) find evidence that analysts' uncertainty in predicting earnings is positively associated with ownership concentration, while Haw et al. (2010) come to an opposite result, showing that concentrated ownership does not affect both forecast accuracy and forecast dispersion. Lang et al. (2004) find evidence that analysts avoid following firms in which the family/management group is the biggest shareholder. A few studies have been carried out for non-Anglo-Saxon countries. Using a sample of French firms, Boubaker and Labégorre (2008) investigate the effect of ownership structure on analyst following. They provide evidence that analysts are reluctant to follow family firms as well as those with concentrated control rights. Finally, García-Meca and Sánchez-Ballesta (2011) find a positive association between bank ownership and forecast accuracy for Spanish firms.[2] All studies attribute the effect of ownership structure on the analysts' information environment to the inherent agency problems and the resultant quality of the firm's information environment. Consistent with that, I derive my hypotheses as follows:

[2] It should be noted that, in contrast to this paper, both Boubaker and Labégorre (2008) and García-Meca and Sánchez-Ballesta (2011) examine the effect of ownership structure on the analysts' information environment before IFRS adoption.

Jensen and Meckling (1976) argue that managerial ownership can mitigate agency problems, illustrating that increasing managerial ownership leads to an alignment of interest between inside managers and outside shareholders (alignment theory). Inside managers holding a significant portion of the shares, therefore, have a decreased incentive to consume perquisites and an increased incentive to maximize firm performance. Managers, therefore, take action to pursue the owner's interests in order to maximize firm value. Given the aligned interests with outside shareholders, owning managers have a decreased incentive to hide information, which goes hand in hand with increased transparency and a better firm's information environment (García-Meca and Sánchez-Ballesta 2011). Warfield et al. (1995), Yeo et al. (2002), and Sánchez-Ballesta and García-Meca (2007) support this view, providing evidence for a positive association between managerial ownership and accounting quality.[3] They argue that agency problems are mitigated with increasing managerial ownership which finally leads to an improved accounting quality. On the contrary, increasing managerial ownership may deteriorate a firm's information environment. Managers holding a significant portion of the shares could act in a personally beneficial manner without considering outside shareholders (entrenchment theory). Thus, managers restrict the flow of information to outside shareholders. Supporting this view, Ruland et al. (1990) and Eng and Mak (2003) find evidence that firms with increased managerial ownership are associated with less disclosure. Similarly, Gabrielsen et al. (2002) find evidence for a negative association between accounting quality and managerial ownership. As a consequence of the theoretical discussion as well as prior empirical findings, I am not able to make a clear prediction as to how managerial ownership affects the firm's information

[3] In contrast to Warfield et al. (1995), the studies of Yeo et al. (2002) and Sánchez-Ballesta and García-Meca (2007) find a non-linear relationship between managerial ownership and accounting quality. Therefore, they also provide evidence for a negative relationship between managerial ownership and accounting quality at higher levels of managerial ownership.

environment and, thus, the analysts' information environment. Therefore, I posit the following hypothesis in alternative form:

**Hypothesis (1):** Managerial ownership is not associated with the analysts' information environment.

Family ownership is very prevalent in Germany, as a considerable number of firms are family-owned. Family members often hold crucial positions in the management team as well as on the board of directors (La Porta et al. 1999). Hence, they significantly influence the decision-making process. Similar to managerial ownership, alignment and entrenchment theories are suggested in the literature to explain the diverging effects of family firms on a firm's information environment. Alignment theory assumes owning families to have less of an incentive to hide information due to their strong identification with the firm. Because the wealth of owning families is closely tied to firm value, they are interested in a faithful representation of the firm's situation in order to protect the family's reputation. Consistent with that, Wang (2006), Ali et al. (2007), and Chen et al. (2008) find a positive association between family ownership and firm disclosure. According to entrenchment theory, however, family-owned firms can hide information from other shareholders and may have the incentive to do so. While families often hold crucial positions on both the management and the supervisory board, they may have inferior corporate governance and, therefore, heightened agency problems because of ineffective monitoring by the board (Wang 2006). Moreover, family members have good knowledge about the firm's activities and are well connected among themselves (Ali et al. 2007). They therefore prefer exchanging information via private communication channels, excluding outside shareholders. Given the competing arguments regarding the

effect of family firms on a firm's information environment, and thus, the analysts' information environment, I posit the following hypothesis in alternative form:

**Hypothesis (2):** Family ownership is not associated with the analysts' information environment.

Institutional ownership plays a crucial role in capital markets, as they act as fiduciaries and administer large proportions of the economy's capital. Institutions generally have the opportunity, resources, and capability to monitor and discipline a firm's management (Gillan and Starks 2003). Institutions hence improve information availability and information quality (Jensen and Meckling 1976; Frankel et al. 2006; Ljungqvist et al. 2007). Several studies support this view by providing evidence for a positive association between institutional ownership and the firm's information environment (Healy et al. 1999; Velury and Jenkins 2006; Ramalingegowda and Yu 2012). On the contrary, institutions invest large proportions of capital on behalf of others. In order to do this, institutions exert a great deal of effort persuading fund sponsors of their investment quality. As such, institutions may be interested in short-term performance rather than long-run objectives. Consequently, institutions favor or even pressure the management to misreport financials and/or selectively disclose, which impairs a firm's information environment. Again, I cannot clearly predict how institutional ownership affects a firm's information environment, and thus, the analysts' information environment. Therefore, I posit the following hypothesis in alternative form:

**Hypothesis (3):** Institutional ownership is not associated with the analysts' information environment.

The theoretical explanation on how bank ownership affects a firm's information environment is generally related to institutional ownership. Nevertheless, in contrast to other institutions, banks play a major role in German ownership structure. For example, the German external capital market is less developed than the U.S. capital market. German companies, therefore, still rely heavily on the banking system when it comes to external financing as banks continue to be the major providers of financial resources. This leads to considerable flows of information to banks, which enables them to effectively monitor a firm's management (Cable 1985; Gorton and Schmid 2000; Chirinko and Elston 2006). Moreover, in contrast to other institutions, banks exercise control in several ways. Besides their voting power from direct shares, banks often hold proxy votes on behalf of others (Edwards et al. 2000). It is also common for banks to be largely represented in the companies' supervisory board. Consequently, owning banks prevalently have significant influence on decision-making process and superior access to internal information. Banks, therefore, are likely to be better informed than other institutional investors (Cable 1985). Generally speaking, banks can appropriately solve agency problems, given their consolidated voting power, representation on the supervisory board, and assumed long-term relations. This, in turn, improves a firm's information environment (Chirinko and Elston 2006). Supporting this, Ang et al. (2000) find evidence of decreased agency costs due to greater monitoring by banks. Nevertheless, because of banks' dual role as lenders and equity holders and the fact that German companies rely heavily on the banking system for external financing, they may act primarily in their own interest, to the detriment of other shareholders. Consequently, bank ownership may increase agency problems, impairing the firm's information environment and analysts' information environment, respectively. Given the competing

arguments and the limited empirical research, I posit the following hypothesis in alternative form:

**Hypothesis (4):** Bank ownership is not associated with the analysts' information environment.

Prior research attributes the effect of ownership structure on the analysts' information environment to the inherent agency problems and the resultant quality of a firm's information environment (e.g., Bhushan 1989; Parkash et al. 1995; Lang et al. 2004; Boubaker and Labégorre 2008; Haw et al. 2010; García-Meca and Sánchez-Ballesta 2011). My hypotheses align with this view. Nevertheless, a firm's information environment consists of a wide variety of sources. By examining an undifferentiated overall effect, prior studies have failed to account for the mechanisms at work. To determine whether this attribution from prior research is indeed accurate, I undertake a simplistic classification of the firm's information environment, suggesting that the firm's information environment can be divided into two main components: (1) a quality component, which I define as the quality of a firm's accounting numbers, denoted by "accounting quality" and (2) a component consisting of other information provided by a firm that potentially influences the analysts' information environment, denoted by "other information".[4] Subsequently, I examine if the overall effect of ownership structure on the analysts' information environment is either attributable to an improved information environment of firms due to an indirect effect (mediated by accounting quality) or rather to a direct effect, which I hypothesize to be attributable to an improved

[4] "Other information" could be interviews with company executives, annual and interim stockholders' reports, management earnings forecasts, formal presentations by company executives, information through better investor relations, the publication of supplemental disclosures outside the required periodic reports, conference calls with financial analysts, or any other corporate communications. Ramnath et al. (2008) offer an overview of firm-provided information being affected by the analysts' information environment. Beyer et al. (2010) give a general overview of the firms' information environment.

information environment of firms due to "other information".[5] I expect both mechanisms to be at work and, therefore, posit the following hypothesis in alternative form:

**Hypothesis (5):** The effect of ownership structure on the analysts' information environment is attributable neither to an indirect effect (mediated by accounting quality) nor to a direct one (due to "other information").

## 3 Research Design

To test my Hypotheses (1) – (4), I posit the regression model as presented in Eq. (1). To do this, I use forecast accuracy (i.e., FA) as my measure for the analysts' information environment and MANAG, FAM, INST, and BANK as my variables of interest. Consistent with prior studies on the effect of ownership structure on forecast accuracy (e.g., Parkash et al. 1995; Haw et al. 2010; García-Meca and Sánchez-Ballesta 2011), Eq. (1) does not control for potential effects of accounting quality. Therefore, Eq. (1) provides no evidence for the direct and indirect effects but rather the overall effect (which equals the sum of the direct and indirect effects) of ownership structure on forecast accuracy.

$$(1)\ FA = \beta_0 + \beta_1(MANAG) + \beta_2(FAM) + \beta_3(INST) + \beta_4(BANK) + \beta_5(HERFINDAHL) + \beta_6(LNTA) + \beta_7(LOSS) + \beta_8(LAGLOSS) + \beta_9(EARNSURP) + \beta_{10}(LEVERAGE) + \beta_{11}(GROWTH) + \beta_{12}(OCF) + \beta_{13}(ZSCORE) + \beta_{14}(BIG4) + \beta_{15}(HORIZON) + \beta_{16}(LNNUMEST) + \beta_{17}(STDFC) + industry\ and\ year\ fixed\ effects + \varepsilon_i$$

[5] Indeed, by attributing the direct effect of ownership structure on forecast accuracy to a firm's improved information environment due to "other information", I am essentially hypothesizing an indirect effect. The purpose of this study, however, is to investigate the indirect effect of a particular component of a firm's information environment (i.e., accounting quality). In this respect, further research is required to document other explicit ways ownership affects the analysts' information environment, which I, for the sake of convenience, hypothesize to be attributable to a direct effect.

All variables used in Eq. (1) are defined in the Appendix. Following Lang and Lundholm (1996), I define forecast accuracy as the negative of the absolute value of analysts' forecast error, that is, the difference between the median forecasted earnings per share and actual earnings per share scaled by the stock price at the beginning of the fiscal year. More accurate forecasts are thus represented by higher values. Because I expect a nonlinear relationship between ownership structure and forecast accuracy, I use dummy variables for my four ownership types. With regard to FAM, INST, and BANK, dummy variables take the value of 1, if the percentage of shares held by the respective shareholder exceeds 25 percent, and 0 otherwise. A threshold of 25 percent has been chosen because, under German corporate law, the 25-percent threshold exceeding shareholders can block important decisions. The dummy variable MANAG takes the value of 1, if the percentage of shares held by inside managers exceeds 1 percent, and 0 otherwise. Here, a considerably smaller threshold has been chosen for two reasons. First, it is not common for inside managers in Germany to hold a large portion of shares. Second, I believe that a small portion of shares is more valuable to an individual inside manager than outside banks, other institutions, and families. In addition to my four ownership types, I also incorporate HERFINDAHL to control for ownership concentration.

Consistent with prior empirical studies focusing on analysts' forecast accuracy, a number of independent control variables are added to the model. To do this, I consider both firm-specific and analyst-specific variables. Existing literature provides broad evidence that the analysts' information environment is positively associated with firm size (Bhushan 1989; Brennan and Hughes 1991; Lang and Lundholm 1996; Lang et al. 2003). Large firms are expected to have better information environments than small ones. Large firms therefore make additional disclosures, which lead to more accurate

forecasts. To capture this, I add LNTA to the model. Several studies indicate that forecast accuracy is lower for loss firms (Hwang et al. 1996; Peek 2005; Byard et al. 2006). To control for this, I incorporate LOSS and LAGLOSS into the model. I include EARNSURP because prior studies show that forecast accuracy is lower in firms with highly volatile earnings (e.g., Lang and Lundholm 1996). I also add LEVERAGE to the model. On the one hand, it is argued that highly leveraged firms have a more volatile profit record which makes forecasting more difficult (Eddy and Seifert 1992). On the other, highly leveraged firms are forced to disclose more detailed information in order to meet debt covenants. This leads to a better information environment and more accurate forecasts, respectively. GROWTH is included because high-growth firms are often designated to have unstable business operations with less informative earnings (Fan and Wong 2002). I therefore expect GROWTH to negatively affect forecast accuracy. McNichols and O'Brien (1997) find evidence that financial analysts prefer following profitable firms. I expect a firm's profitability to also be associated with forecast accuracy and, thus, add OCF to the model. I also add Zmijewski's (1984) ZSCORE to the model to control for client specific default risk. A lower z-score indicates that the clients' economic stability is higher and, therefore, the clients' probability for default is alleviated. Nevertheless, the effect of ZSCORE on forecast accuracy cannot be clearly predicted. On the one hand, financially distressed firms are expected to have unstable business operations, resulting in less accurate forecasts. On the other, financially distressed firms could be subject to increased monitoring through regulatory authorities. This leads to higher quality information in financial disclosures and, therefore, increased forecast accuracy. Finally, I add BIG4 to the model to control for potential effects of audit quality. To my knowledge, only two studies provide evidence on how audit quality affects forecast accuracy. Payne (2008) shows that

enhanced audit quality constrains opportunistic earnings management in order to meet or beat analysts' forecasts, resulting in less accurate forecasts. Behn et al. (2008) come to an opposite result by providing evidence for a positive effect of audit quality on analysts' forecast accuracy. The authors argue that enhanced audit quality improves the information quality in financial disclosures, which increases analysts' forecast accuracy. As analyst-specific variables, I further add HORIZON, LNNUMEST, and STDFC to the model. Forecast horizon (i.e., HORIZON) is probably the most commonly used and most decisive analyst-specific factor of the analysts' information environment. Several studies find broad evidence that the accuracy of analysts' forecast decreases the larger the horizon between the date of the analysts' forecast and the date of a firm's earnings announcement (Mikhail et al. 1997; Jaggi and Jain 1998; Clement 1999; Jacob et al. 1999; Mest and Plummer 1999; Duru and Reeb 2002; Clement et al. 2003; Clement and Tse 2003; Bolliger 2004). Furthermore, in accordance with Lys and Soo (1995) and Hope (2003b), I expect an increased accuracy of analyst forecasts the more forecasting analysts there are. I therefore add LNNUMEST to the model. Duru and Reeb (2002) and Byard et al. (2006) suggest that forecast dispersion reflects a lack of consensus among analysts and find that forecast dispersion negatively affects analysts' forecast accuracy. Hence, I add the standard deviation of analyst earnings forecasts (i.e., STDFC) to the model. Finally, the model contains 10 industry indicator variables as defined by Frankel et al. (2002) and modified by Ernstberger et al. (2015).[6] The model is estimated using a pooled sample of 886 firm-year observations and includes industry-fixed effects as well as year-fixed effects to control for potential industry- and year-heterogeneity. To control

[6] According to Ernstberger et al.'s (2015) modifying Frankel et al.'s (2002) industry membership to a German context, the classification is defined by SIC code as follows: agriculture (0100-0999), mining and construction (1000-1999, excluding 1300-1399), consumer manufacturers (2000-2111, 2200-2799), chemicals, pharmaceuticals, and refining (1300-1399, 2800-2824, 2830-2836, 2840-2899, 2900-2999), durable manufacturers (3000-3999, excluding 3570-3579 and 3670-3679), transportation (4000-4899), utilities (4900-4999), retail (5000-5999), services (7000-8999, excluding 7370-7379), and computers (3570-3579, 3670-3679, 7370-7379).

for heteroscedasticity, the analysis further employs heteroscedasticity-adjusted robust standard errors clustered by firm.

To test my Hypothesis (5), I posit the regression model as presented in Eq. (2). Note that Eq. (2) is similar to Eq. (1) except that the accounting quality measure (i.e., |DA|) is added to the model.[7] By estimating Eq. (2), I am able to investigate whether ownership influences the analysts' information environment specifically and indirectly via the quality of the accounting numbers. Therefore, Eq. (2) highlights the existence of an indirect association between ownership structure and forecast accuracy.

$$
\begin{aligned}
(2)\ FA = {} & \beta_0 + \beta_1(|DA|) + \beta_2(MANAG) + \beta_3(FAM) + \beta_4(INST) + \beta_5(BANK) + \\
& \beta_6(HERFINDAHL) + \beta_7(LNTA) + \beta_8(LOSS) + \beta_9(LAGLOSS) + \\
& \beta_{10}(EARNSURP) + \beta_{11}(LEVERAGE) + \beta_{12}(GROWTH) + \beta_{13}(OCF) + \\
& \beta_{14}(ZSCORE) + \beta_{15}(BIG4) + \beta_{16}(HORIZON) + \beta_{17}(LNNUMEST) + \\
& \beta_{18}(STDFC) + industry\ and\ year\ fixed\ effects + \varepsilon_i
\end{aligned}
$$

All variables used in Eq. (2) are defined in the Appendix. Consistent with prior empirical findings on the association between the firm's information environment and analysts' forecast accuracy (Lang and Lundholm 1996; Healy et al. 1999; Francis et al. 1997; Basu et al. 1998; Bradshaw et al. 2001; Bowen et al. 2002; Abarbanell and Lehavy 2003; Hope 2003a; Hope 2003b; Bushman et al. 2004), I expect accounting quality to be positively associated with the analysts' information environment.

As Eq. (2) provides no information about the relative importance of the direct and indirect effects of ownership structure on forecast accuracy, I additionally perform

[7] Accounting quality is not directly observable. I therefore focus on a common proxy for earnings management, as my accounting quality measure (discretionary accruals). More precisely, I focus on the absolute value of discretionary accruals. Improved accounting quality is thus represented by lower values. Following Wang (2006), I estimate discretionary accruals by using the model of Ball and Shivakumar (2006). The model is estimated for the full sample of German-listed firms by year and for each industry using a total of 3,350 firm year observations, requiring at least 10 observations for all year-industry combinations.

path analysis.[8] Path analyses decompose the correlation between two variables (i.e., ownership structure and forecast accuracy) into a direct path and an indirect path that includes a mediating variable (i.e., accounting quality) and simultaneously provides significance levels for each path. As key outputs, path analyses compute path coefficients that link two variables in a path. In my setting, the direct path equals the path coefficient between ownership structure and forecast accuracy, whereas the mediated path is the product of the path coefficient between ownership structure and accounting quality and the path coefficient between accounting quality and forecast accuracy. Figure 1 illustrates this relationship.

**[Figure 1]**

The relative importance of each path is then computed as the ratio of the direct (indirect) path coefficient between ownership structure and forecast accuracy to the total correlation between ownership structure and forecast accuracy. The total effect of ownership structure on forecast accuracy, in turn, equals the sum of the direct effect of ownership structure on forecast accuracy and the indirect effect (mediated by accounting quality) of ownership structure on forecast accuracy, respectively.

# 4 Sample and Empirical Analyses

## 4.1 Sample Composition

My analyses use data from non-financial German firms with IFRS-consolidated financial statements listed in the regulated market of the Frankfurt Stock Exchange from 2006-2010. Because my study takes place within the same institutional setting, I automatically control for institutional factors and regulatory requirements (Ernstberger 2008). Financial data was obtained from the *Thomson Reuters Worldscope Database*.

[8] For this purpose, I use the CALIS procedure in SAS. This procedure is available at: http://www.ats.ucla.edu/stat/sas/faq/path_analysis.htm

Analyst variables were calculated by using data from the *Historical Institutional Brokers' Estimate System (I/B/E/S) Database*. Finally, I used the *Amadeus*, a database of *Bureau van Dijk Electronic Publishing*, to calculate ownership variables. In addition to financial data, *Amadeus* also contains information on the ownership structure of firms, including the names of owners and their respective ownership shares. *Amadeus* collects information from a variety of sources: (1) directly from the firm's annual reports, (2) from official bodies, (3) from press releases, (4) from regulatory authorities, and (5) from the associated information provider (e.g., *Verband der Vereine Creditreform* for Germany). My ownership variables are based on direct ownership information, since data on ultimate ownership is relatively scarce. Based on the predefined ownership-type-categories of *Amadeus*, I define my four ownership variables as follows: managerial ownership refers to the Amadeus-ownership-type category "M" and is defined as the sum of shares held by managers and directors. Family ownership refers to the Amadeus-ownership-type category "I" and is defined as the sum of shares held by one or more known individuals or families. Institutional ownership refers to the Amadeus-ownership-type categories "F", "A", "E", and "P" and includes the sum of shares of financial companies, insurance companies, pension and mutual funds, and certain investment companies. Finally, bank ownership refers to the Amadeus-ownership-type category "B" and contains the sum of shares held by private, cooperative, savings, and special purpose banks. In accordance with prior research, I exclude all financial firms corresponding to the SIC codes 6000-6999 because of their special accounting practices. The initial sample thus consists of 614 companies and 3,350 firm-year observations. After merging financial data with analyst data and ownership data, I omit 1,829 firm-year observations due to missing data and 630 firm year-observations due to missing required control variables. Finally, I removed all firm-

year observations referring to the industry classification agriculture (SIC codes 0100-0999), as this industry includes only five firm-year observations. This leaves a final sample of 256 companies and 886 firm-year observations. Panel A of Table 1 summarizes the sample adjustments mentioned above and shows the final sample composition. Panel B presents the yearly distribution of firm observations, while Panel C gives an overview of the distribution of firm observations according to Frankel et al.'s (2002) and modified by Ernstberger et al. (2015) industry classification.

**[Table 1]**

## 4.2 Descriptive Statistics

The descriptive statistics of the variables used in this study are presented in Table 2. To effectively control for outliers, all continuous variables are winsorized at the 1-percent level and, respectively, 99-percent level. With regard to the distribution of variables shown in Table 2, it is worth noting the following facts. The mean (median) value of forecast accuracy (i.e., FA) amounts to -4.0 (-1.0) percent. My accounting quality measure (i.e., |DA|) displays a mean (median) of 5.7 (3.5) percent of lagged total assets. Delogging the variables LNTA and LNNUMEST on the individual firm-year level shows that the average (median) firm in the sample has total assets of € 3,220 Mio. (€ 226 Mio.), and is followed by an average (median) of 8.7 (4.0) financial analysts. Other noteworthy aspects of the sample composition are an average (median) financial leverage (LEVERAGE) of 48.0 (51.1), an average (median) sales growth rate (GROWTH) of 11.8 (7.7) percent, and an average (median) cash flow from operation (OCF) of 7.4 (7.8) percent. My ownership concentration measure HERFINDAHL shows an average (median) of 43.9 (40.2) percent. With regard to my binary variables, 26.9 (7.2) percent of the sample composition consists of firms in which the ownership percentage of families (banks) exceeds the 25.0-percent threshold, while other

institutions are present in 16.3 percent. The 1.0-percent threshold exceeding owning managers are reflected in 5.5 percent of the sample composition. Table 2 also shows that 19.4 (17.9) percent of the sample firms report a loss in the current (previous) sample period. Finally, descriptive statistics indicate that 66.9 percent of the sample firms are audited by a BIG4 auditor.

**[Table 2]**

Table 3 presents the Pearson correlation matrix of the variables used in this study. It shows that forecast accuracy (i.e., FA) is significantly negatively correlated ($\rho = -0.3629$) with the level of discretionary accruals (i.e., |DA|). It furthermore shows that three of my four ownership variables (MANAG, INST, and BANK) are positively correlated with forecast accuracy. Nevertheless, only bank ownership shows a significant p-value ($\rho = 0.0721$). No significant correlation is observable for ownership concentration (HERFINDAHL). The majority of the other control variables correlate significantly with forecast accuracy (i.e., FA). Furthermore, it is worth noting that LNTA is significantly correlated with LNNUMEST ($\rho = 0.7870$) and STDFC ($\rho = 0.4947$). These correlations suggest that more financial analysts follow large firms and are associated with a higher standard deviation of analyst earnings forecasts. Table 3 also shows that LEVERAGE is significantly correlated with ZSCORE ($\rho = 0.6500$) and that LNNUMEST is significantly correlated with STDFC ($\rho = 0.4702$). These correlations highlight that highly leveraged firms are more likely to go bankrupt and that the dispersion of analysts' forecasts increases with the number of analysts following a firm. In order to eliminate potential concerns with respect to multicollinearity, I compute the variance inflation factors, which lie between 1 and 5 for all regression models used in this study, indicating no multicollinearity problems.

**[Table 3]**

## 4.3 Multivariate Analyses

Table 4 presents the results of estimating Eq. (1). It shows that MANAG is significantly positively associated with forecast accuracy.[9] With regard to FAM, INST, BANK, and my ownership concentration measure HERFINDAHL, no significant correlation is observable. With regard to the control variables, 7 out of 12 variables are significantly associated with the dependent variable (i.e., FA). The results show that financially distressed firms have less accurate forecasts, illustrated by the negative sign of ZSCORE. As expected and consistent with prior studies, LOSS and LAGLOSS are significantly negatively correlated with forecast accuracy. My measure of firm performance OCF also shows a negative association with forecast accuracy. This result aligns with Sloan (1996) and Xie (2001) and suggests that financial analysts fail to fully reflect information contained in the cash flow component of earnings.[10] Finally, it can be seen that HORIZON (LNNUMEST) negatively (positively) affects forecast accuracy.

**[Table 4]**

Table 5 presents the results of estimating Eq. (2). It shows that financial analysts' ability to build accurate forecasts depends strongly on accounting quality, illustrated by the significantly negative association of discretionary accruals and forecast accuracy. With regard to my ownership variables, MANAG is significantly

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[9] Keep in mind that, in accordance with prior studies (e.g., Parkash et al. 1995; Haw et al. 2010; García-Meca and Sánchez-Ballesta 2011), Table 4 provides the results of the overall effect of ownership structure on forecast accuracy. Therefore, I am initially not aware if the positive overall effect of managerial ownership on forecast accuracy is either attributable to an improved firm's information environment due to an indirect effect (mediated by accounting quality) or to a direct effect, which I hypothesize to be attributable to an improved firm's information environment due to "other information". Hence, it is not understood how managerial ownership affects a firm's information environment and how this association ultimately affects the analysts' information environment.

[10] By using a simple trading strategy, Sloan (1996) and Xie (2001) have shown that investors tend to underprice (overprice) stocks in which the cash flow component is relatively high (low), indicating that investors naively fixate on earnings rather than distinguishing between the different properties of the accrual and cash flow component of current earnings.

positively associated with forecast accuracy. After controlling for accounting quality, the potentially present indirect effects (mediated by accounting quality) of my ownership variables on forecast accuracy are captured by the direct effect of accounting quality. Therefore, the positive effect of managerial ownership on forecast accuracy is attributable to a direct effect, which I hypothesize to be attributable to a firm's improved information environment due to "other information". In addition to MANAG it can be seen that BANK is also significantly positively associated with forecast accuracy. This finding suggests that bank ownership has both a positive direct effect and a negative indirect one.[11] Regarding the insignificant overall effect of BANK in the model not controlling for accounting quality (Eq. (1) in Table 4), the two effects seem to offset each other. Finally, with regard to my control variables, it can be seen that LOSS, LAGLOSS, OCF, ZSCORE, HORIZON, and LNNUMEST are significantly correlated with forecast accuracy.

**[Table 5]**

Table 6 presents the results of estimating path analysis. It shows that the total association of MANAG and forecast accuracy is significantly positive and about 93.8 percent attributable to a significant direct effect. As assumed, the indirect effect is insignificant and amounts to only 6.2 percent. With regard to BANK, the results show an insignificant total association of bank ownership and forecast accuracy. However, the direct association of BANK and forecast accuracy is significantly positive, while the indirect association of BANK is significantly negative. This result suggests that the two effects offset each other. With respect to the relative importance of the correlation between BANK and forecast accuracy, about 62.0 percent are attributable to a direct

[11] The negative indirect effect (mediated by accounting quality) of bank ownership is captured by the direct effect of accounting quality (i.e., |DA|). Therefore, the remaining significantly positive direct effect of bank ownership on forecast accuracy is attributable to a firm's improved information environment due to "other information".

effect and about 38.0 percent to an indirect one. Altogether, the results of Table 6 are in line with the results of Eq. (1) in Table 4 and Eq. (2) in Table 5, respectively, and underline the importance of explicitly considering a firm's information environment when examining the effect of ownership structure on forecast accuracy.

**[Table 6]**

## 4.4 Sensitivity Analyses

To strengthen the reliability of my results, I perform a wide variety of additional sensitivity analyses.

First, Eq. (2) measures the effects of ownership structure and accounting quality on forecast accuracy at a specific point in time. An obvious alternative is to examine the relation between changes in ownership structure, changes in accounting quality, and changes in forecast accuracy. Therefore, I further estimate the following change model in Eq. (3).[12]

$$
\begin{aligned}
(3)\ FA_{change} = {} & \beta_0 + \beta_1(|DA|_{change}) + \beta_2(MANAG_{change}) + \beta_3(FAM_{change}) + \\
& \beta_4(INST_{change}) + \beta_5(BANK_{change}) + \beta_6(HERFINDAHL_{change}) + \\
& \beta_7(LNTA_{change}) + \beta_8(EARNSURP_{change}) + \beta_9(LEVERAGE_{change}) + \\
& \beta_{10}(GROWTH_{change}) + \beta_{11}(OCF_{change}) + \beta_{12}(ZSCORE_{change}) + \\
& \beta_{13}(HORIZON_{change}) + \beta_{14}(LNNUMEST_{change}) + \beta_{15}(STDFC_{change}) + \\
& industry\ and\ year\ fixed\ effects + \varepsilon_i
\end{aligned}
$$

Panel A of Table 7 presents the results of estimating Eq. (3). It shows that changes in accounting quality are still significantly positively associated with changes in forecast accuracy. With regard to my ownership variables, only changes in managerial ownership show a significantly positive correlation with changes in forecast

[12] By calculating my change variables, I omit 286 firm-year observations due to missing information for the prior year. This leaves a sample of 600 firm-year observations for estimating the change model. Moreover, due to an insufficient variability with regard to my ownership dummies, I use changes in the percentage of my four ownership types. For this reason, the model is estimated without incorporating my dummy variables LOSS, LAGLOSS, and BIG4.

accuracy. Nevertheless, in contrast to inside managers actively involved in a firm's management from the first day they were hired, it is reasonable to assume that outside owners such as banks can only exercise their influence at a later point in time. In particular, outside owners not part of the management are unlikely to be conversant with internal structures and, thus, need more time to deploy their influential power. To capture this, I also estimate the change model by using lagged changes with regard to my ownership variables.[13] Panel B of Table 7 presents the results of estimating the lagged version of Eq. (3). As expected, lagged changes in bank ownership are significantly positively associated with changes in forecast accuracy. The association of changes in accounting quality and changes in forecast accuracy remains significant and positive.

**[Table 7]**

Second, my ownership variables were measured at the first-tier level (i.e., direct shareholdings only) without considering pyramid ownership structures. Nevertheless, the direct shareholdings can be very different from that when tracing up the pyramid structure to the corresponding ultimate owner (La Porta et al. 1999). To capture this, for each of my ownership variables, I also incorporate dummy variables that take the value of 1, if the ultimate owner is a family, a bank, another institution, or an inside manager, and 0 otherwise. I define the ultimate owner as a shareholder with determining voting rights in a firm and someone not controlled by anyone else, so I set the ultimate owner's voting rights level at 50 percent. The results (not tabulated) show that bank ownership as well as managerial ownership are still significantly positively associated with forecast accuracy at the first-tier level.

[13] By calculating lagged changes, I omit an additional 60 firm-year observations, leaving a sample of 540 firm-year observations for estimating the change model with lagged ownership changes.

Third, although discretionary accruals models are widely used in the accounting literature and are considered to be appropriate proxies for accounting quality (Dechow et al. 1995; Bartov et al. 2000), there is no exact method to estimate discretionary accruals. Accordingly, I use the modified Jones model, including the book-to-market ratio and cash flows (Larcker and Richardson 2004), as an alternative specification to determine discretionary accruals and subsequently re-estimate Eq. (2). The results (not tabulated) show that BANK, MANAG, and |DA| are still significantly correlated with forecast accuracy in the predicted direction.

Fourth, Eq. (2) was measured by incorporating ownership dummies with regard to my four ownership types. An obvious alternative would be to use the percentage of ownership. Table 8 shows that the level of discretionary accruals and managerial ownership are still significantly associated with forecast accuracy in the predicted direction. With regard to bank ownership, no significant correlation is observable. However, banks often invest their capital in a wide variety of projects. Their willingness to deploy their influential power, therefore, may depend on the value of their investments. To capture this aspect, I vary the threshold level of bank ownership for my BANK dummy variable specification.[14] Untabulated results show that BANK is significantly positively correlated with forecast accuracy from a 22-percent threshold.

**[Table 8]**

Fifth, I have argued that the positive effect of managerial ownership and bank ownership on forecast accuracy is attributable to the ability of those two ownership types to mitigate agency problems. If this attribution holds true, the positive influence of MANAG and BANK on forecast accuracy should be highlighted in times of increased uncertainty. Thus, I re-estimate Eq. (2) for the financial crisis years 2008 and 2009, a

[14] I consecutively re-estimate Eq. (2) for the following thresholds with regard to BANK: 10 percent, 15 percent, 16 percent, 17 percent, 18 percent, 19 percent, 20 percent, 21 percent, 22 percent, 23 percent, and 24 percent.

period of increased uncertainty. Table 9 shows that |DA|, MANAG, and BANK are still significantly associated with forecast accuracy. Moreover, it can be seen that the coefficients of MANAG and BANK are considerably higher than in the model estimated for the full sample period (MANAG: $Coef_{Table9}$ = 0.22366, $Coef_{Table5}$ = 0.01989 and BANK: $Coef_{Table9}$ = 0.04625, $Coef_{Table5}$ = 0.02054). Performing a Wald test for the equality of the regression coefficients within each group provides evidence that the regression coefficients differ significantly. As a whole, the results strengthen the conclusion that bank ownership and managerial ownership mitigate agency problems.

**[Table 9]**

Sixth, due to the skewed distribution of my forecast accuracy measure (i.e., FA), I re-estimate Eq. (2) by using the natural log of the absolute value of the analyst forecast error. Results (not tabulated) are consistent with those reported in Table 5.

Seventh, while I examined the effect of managerial ownership, family ownership, institutional ownership, and bank ownership on forecast accuracy, I did not consider any potential influences of dispersed ownership. However, dispersed ownership is likely to be associated with less effective monitoring of management, since monitoring costs are too high from the point of view of a small individual shareholder (Jensen and Meckling 1976). As a consequence, I re-estimate Eq. (2) by also incorporating the percentage held by widely dispersed shareholders. The results (not tabulated) remain qualitatively unchanged.

Finally, I add the dummy variables DAX, MDAX, SDAX, and TECDAX to Eq. (2) to control for the structure of the German capital market and the related public disclosure requirements. These individual dummy variables take the value of 1, if the sample firm is listed in one of the four main indices of the Frankfurt Stock Exchange during the sample period, and 0 otherwise. The results (not tabulated) show that bank

ownership, managerial ownership, and accounting quality are still significantly positively associated with forecast accuracy.

## 5 Conclusion

The objective of this study is to examine the effect of ownership structure on forecast accuracy and the extent to which this association is attributable to a direct or indirect effect. For that purpose, I suggest a simplistic classification of a firm's information environment. I argue that a firm's information environment can be divided into two main components: (1) a quality component, which I define as the quality of the firm's accounting numbers, denoted by "accounting quality" and (2) a component consisting of other information provided by a firm that potentially influences the analysts' information environment, denoted by "other information". Subsequently, I examine if the overall effect of ownership structure on the analysts' information environment is either attributable to an improved firm's information environment due to an indirect effect (mediated by accounting quality) or rather to a direct effect, which I hypothesize to be attributable to an improved firm's information environment due to "other information".

Using a sample of German-listed firms from 2006-2010, I find evidence that managerial ownership and bank ownership positively and directly affect the analysts' information environment. Thus, it is easier for financial analysts to provide more accurate forecasts to investors when managers or banks hold a significant portion of the company shares. I also show that accounting quality is significantly positively associated with forecast accuracy. This finding confirms the assumption of previous studies on the effect of ownership structure on forecast accuracy and suggests that the quality of analysts' forecasts strongly depends on the quality of the firm's information environment. Only for bank ownership, I find statistically reliable evidence of an

indirect effect on forecast accuracy via accounting quality. Overall, my results show the importance of the firm's ownership structure in explaining analysts' forecasts. By investigating the direct and indirect effects of ownership structure on forecast accuracy, my study is the first to offer deeper insight into how a firm's ownership structure affects its information environment and how a firm's ownership structure and its information environment ultimately shape the analysts' information environment.

However, the results of this study are subject to the following limitations. First, I use discretionary accruals as my proxy for accounting quality. Accounting quality is not directly observable and, therefore, is difficult to measure. Hence, although discretionary accruals are widely used in the accounting literature as proxies of accounting quality, my results should be interpreted with caution. I have, however, performed sensitivity analyses by using an alternative specification of discretionary accruals, and the results appear to be robust. Second, while I have found evidence of an indirect effect of ownership structure on forecast accuracy mediated by accounting quality, I did not investigate further into how the firm's ownership structure is associated with a direct effect. Indeed, I hypothesized a direct effect to be attributable to "other information". Nevertheless, "other information" is a broad notion and contains a wide variety of procedures that go beyond the information provided in annual reports. As such, further research is required in order to document other explicit paths of how ownership affects financial analysts' forecast accuracy.

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## **Appendix** Variable definitions

| Variable | Description |
|---|---|
| *\|DA\|* | - The absolute value of discretionary accruals measured by the Ball and Shivakumar (2006) model |
| *BANK* | - Indicator variable that takes the value of 1, if the percentage of shares held by banks exceeds 25 percent, 0 otherwise |
| *BIG4* | - Indicator variable that takes the value of 1, if the audit company is either KPMG, PwC, Deloitte or Ernst & Young, 0 otherwise |
| *EARNSURP* | - The absolute value of the difference between the current earnings per share and the lagged earnings per share, scaled by the firm stock price at the beginning of the fiscal year |
| *FA* | - The negative of the absolute value of the difference between the median of forecasted earnings per share and actual earnings per share, scaled by the stock price at the beginning of the fiscal year |
| *FAM* | - Indicator variable that takes the value of 1, if the percentage of shares held by families exceeds 25 percent, 0 otherwise |
| *GROWTH* | - Sales growth rate |
| *HERFINDAHL* | - The sum of squares of the ownership percentage held by all shareholders |
| *HORIZON* | - Number of days between the company's announcement date and the date of the forecast |
| *INST* | - Indicator variable that takes the value of 1, if the percentage of shares held by institutions exceeds 25 percent, 0 otherwise. I define institutions as the sum of shares held by insurance companies, pension funds, mutual funds and certain investment companies |
| *LAGLOSS* | - Indicator variable that takes the value of 1, if the prior year’s net income is negative, 0 otherwise |
| *LEVERAGE* | - Long-term liabilities divided by total assets |
| *LNNUMEST* | - Natural log of the number of analyst earnings forecasts |
| *LNTA* | - Natural log of total assets |
| *LOSS* | - Indicator variable that takes the value of 1, if the current year’s net income is negative, 0 otherwise |
| *MANAG* | - Indicator variable that takes the value of 1, if the percentage of shares held by managers exceeds 1 percent, 0 otherwise |
| *OCF* | - Cash flow from operations scaled by total assets |
| *STDFC* | - Standard deviation of analyst earnings forecasts |
| *ZSCORE* | - Zmijewski's (1984) financial condition index |

## **Table 1** Sample description

Panel A: Sample selection process

| **Sample selection steps** | **Firm-years** | **Firms** |
|---|---|---|
| *Initial sample* - German listed firms having IFRS financial information available in the *Thomson Reuters Worldscope Database* (2006-2010); excluding SIC Codes 6000-6999 | 3.350 | 614 |
| *less:* Merging the financial data with analyst data and ownership data | 1.829 | |
| *less:* Missing control variables | 630 | |
| *less:* All observations which refer to the SIC Codes 0100-0999 | 5 | |
| Final study sample | 886 | 256 |

Panel B: Firm observations by year

| **Year** | **Firms** | **%** |
|---|---|---|
| 2006 | 148 | 17% |
| 2007 | 173 | 20% |
| 2008 | 188 | 21% |
| 2009 | 184 | 21% |
| 2010 | 193 | 22% |

## **Table 1 (continued)** Sample description

Panel C: Firm-year observations by industry

| **Industry classification** | **Firm-years** | **%** |
|---|---|---|
| Mining and construction (SIC Codes 1000-1999, excl. 1300-1399) | 24 | 3% |
| Consumer manufacturers (SIC Codes 2000-2111, 2200-2799) | 61 | 7% |
| Chemicals, pharmaceuticals and refining (SIC Codes 1300-1399, 2800-2824, 2830-2836, 2840-2899, 2900-2999) | 83 | 9% |
| Durable manufacturers (SIC Codes 3000-3999, excl. 3570-3579 and 3670-3679) | 257 | 29% |
| Transportation (SIC Codes 4000-4899) | 51 | 6% |
| Utilities (SIC Codes 4900-4999) | 24 | 3% |
| Retail (SIC Codes 5000-5999) | 81 | 9% |
| Services (SIC Codes 7000-8999, excl. 7370-7379) | 103 | 12% |
| Computers (SIC Codes 3570-3579, 3670-3679, 7370-7379) | 202 | 23% |

**Notes:**
Panel A of Table 1 presents the sample selection process taken to derive the final study sample. Panel B (Panel C) reports the distribution of the sample by year (by industry).

**Table 2** Descriptive statistics

| Continuous variables | Mean | Std. Dev. | Min | Q1 | Median | Q3 | Max | Firm-years |
|---|---|---|---|---|---|---|---|---|
| *FA* | -0.03959 | 0.08663 | -0.54632 | -0.02971 | -0.00984 | -0.00358 | 0.00000 | 886 |
| *\|DA\|* | 0.05675 | 0.06552 | 0.00042 | 0.01592 | 0.03475 | 0.07484 | 0.39401 | 886 |
| *HERFINDAHL* | 0.43880 | 0.23657 | 0.02666 | 0.26933 | 0.40231 | 0.54621 | 1.00000 | 886 |
| *LNTA* | 12.77768 | 2.05456 | 8.77586 | 11.15448 | 12.32814 | 14.09031 | 17.75427 | 886 |
| *EARNSURP* | 1.69616 | 2.81724 | 0.00572 | 0.30938 | 0.80722 | 1.91940 | 22.96981 | 886 |
| *LEVERAGE* | 0.47999 | 0.21617 | 0.05114 | 0.33619 | 0.51094 | 0.63646 | 1.01732 | 886 |
| *GROWTH* | 0.11811 | 0.31066 | -0.62445 | -0.01851 | 0.07746 | 0.20040 | 1.91846 | 886 |
| *OCF* | 0.07357 | 0.12110 | -0.53562 | 0.03823 | 0.07840 | 0.12375 | 0.37690 | 886 |
| *ZSCORE* | -1.40673 | 1.41945 | -4.52909 | -2.35144 | -1.28736 | -0.60433 | 4.95291 | 886 |
| *HORIZON* | 99.20090 | 31.85838 | 42.00000 | 83.00000 | 97.00000 | 105.00000 | 267.00000 | 886 |
| *LNNUMEST* | 1.53990 | 1.16660 | 0.00000 | 0.69315 | 1.38629 | 2.56495 | 3.55535 | 886 |
| *STDFC* | 0.14863 | 0.23071 | 0.00000 | 0.01000 | 0.06000 | 0.18000 | 1.32000 | 886 |

**Table 2 (continued)** Descriptive statistics

| Indicator variables | Mean | Std. Dev. | 0 | 1 | Firm-years |
|---|---|---|---|---|---|
| *MANAG* | 0,05530 | 0,22870 | 837 | 49 | 886 |
| *FAM* | 0,26862 | 0,44349 | 648 | 238 | 886 |
| *INST* | 0,16253 | 0,36914 | 742 | 144 | 886 |
| *BANK* | 0,07223 | 0,25902 | 822 | 64 | 886 |
| *LOSS* | 0,19413 | 0,39575 | 714 | 172 | 886 |
| *LAGLOSS* | 0,17946 | 0,38395 | 727 | 159 | 886 |
| *BIG4* | 0,66930 | 0,47073 | 293 | 593 | 886 |

**Notes:**
Table 2 presents the summary statistics of the variables used in my analyses. All variables are defined in the Appendix.

**Table 3** Pearson correlations among regression variables

| | *FA* | *\|DA\|* | *MANAG* | *FAM* | *INST* | *BANK* | *HERFINDAHL* | *LNTA* | *LOSS* | *LAGLOSS* | *EARNSURP* | *LEVERAGE* | *GROWTH* | *OCF* | *ZSCORE* | *BIG4* | *HORIZON* | *LNNUMEST* | *STDFC* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *FA* | **1.0000** | | | | | | | | | | | | | | | | | | |
| *\|DA\|* | -0.3629 (0.00) | **1.0000** | | | | | | | | | | | | | | | | | |
| *MANAG* | 0.0392 (0.24) | -0.02915 (0.39) | **1.0000** | | | | | | | | | | | | | | | | |
| *FAM* | -0.0063 (0.85) | 0.0097 (0.77) | -0.0575 (0.09) | **1.0000** | | | | | | | | | | | | | | | |
| *INST* | 0.0448 (0.18) | -0.0432 (0.20) | -0.0263 (0.43) | -0.1704 (0.00) | **1.0000** | | | | | | | | | | | | | | |
| *BANK* | 0.0721 (0.03) | 0.0959 (0.00) | -0.0675 (0.04) | -0.1494 (0.00) | 0.2907 (0.00) | **1.0000** | | | | | | | | | | | | | |
| *HERFINDAHL* | -0.0304 (0.37) | 0.0282 (0.40) | -0.0710 (0.03) | -0.1659 (0.00) | -0.2635 (0.00) | -0.3069 (0.00) | **1.0000** | | | | | | | | | | | | |
| *LNTA* | 0.1760 (0.00) | -0.0895 (0.01) | -0.0491 (0.14) | -0.2360 (0.00) | 0.0945 (0.00) | 0.1749 (0.00) | 0.0394 (0.24) | **1.0000** | | | | | | | | | | | |
| *LOSS* | -0.4430 (0.00) | 0.2906 (0.00) | -0.0189 (0.57) | -0.0206 (0.54) | 0.0158 (0.64) | -0.0598 (0.08) | 0.0399 (0.24) | -0.1739 (0.00) | **1.0000** | | | | | | | | | | |
| *LAGLOSS* | -0.2887 (0.00) | 0.1000 (0.00) | 0.0284 (0.40) | -0.0910 (0.01) | -0.0227 (0.50) | -0.0623 (0.06) | 0.0310 (0.36) | -0.1378 (0.00) | 0.3728 (0.00) | **1.0000** | | | | | | | | | |
| *EARNSURP* | -0.0498 (0.14) | 0.1112 (0.00) | -0.0477 (0.16) | 0.0381 (0.26) | -0.0061 (0.86) | 0.0568 (0.09) | 0.0295 (0.38) | 0.3287 (0.00) | -0.0441 (0.19) | -0.0817 (0.02) | **1.0000** | | | | | | | | |
| *LEVERAGE* | -0.1931 (0.00) | 0.0263 (0.44) | 0.0787 (0.02) | -0.0633 (0.06) | 0.0679 (0.04) | -0.0086 (0.79) | -0.0377 (0.27) | -0.0239 (0.48) | 0.1413 (0.00) | 0.1153 (0.00) | -0.0772 (0.02) | **1.0000** | | | | | | | |
| *GROWTH* | 0.0045 (0.89) | 0.0859 (0.01) | -0.0168 (0.62) | 0.0698 (0.04) | 0.0024 (0.94) | 0.0664 (0.05) | 0.0049 (0.88) | -0.0850 (0.01) | -0.1657 (0.00) | -0.0202 (0.55) | 0.0489 (0.15) | -0.0137 (0.69) | **1.0000** | | | | | | |
| *OCF* | 0.1644 (0.00) | -0.0825 (0.00) | -0.0438 (0.19) | 0.0705 (0.04) | -0.0423 (0.21) | 0.0448 (0.18) | 0.0381 (0.26) | 0.1274 (0.00) | -0.4095 (0.00) | -0.3290 (0.00) | 0.1131 (0.00) | -0.1055 (0.00) | -0.0104 (0.76) | **1.0000** | | | | | |
| *ZSCORE* | -0.3328 (0.00) | 0.1059 (0.00) | 0.0887 (0.01) | -0.1627 (0.01) | 0.0633 (0.06) | 0.0025 (0.94) | 0.0310 (0.36) | 0.2860 (0.00) | 0.3715 (0.00) | 0.2261 (0.00) | 0.0734 (0.03) | 0.6500 (0.00) | -0.0645 (0.06) | -0.3667 (0.00) | **1.0000** | | | | |
| *BIG4* | 0.0273 (0.42) | 0.0181 (0.59) | -0.0084 (0.80) | -0.1910 (0.01) | 0.0951 (0.00) | 0.1035 (0.00) | -0.0292 (0.38) | 0.3513 (0.00) | 0.0660 (0.00) | 0.0849 (0.00) | 0.1163 (0.00) | -0.0172 (0.61) | -0.1020 (0.00) | -0.0377 (0.27) | 0.1353 (0.00) | **1.0000** | | | |
| *HORIZON* | -0.2836 (0.00) | 0.0187 (0.58) | -0.0022 (0.95) | 0.1323 (0.00) | -0.0862 (0.01) | -0.0790 (0.02) | -0.0082 (0.81) | -0.3232 (0.00) | 0.1518 (0.00) | 0.1293 (0.00) | -0.0486 (0.15) | 0.1537 (0.00) | 0.0949 (0.00) | -0.1556 (0.00) | 0.1045 (0.00) | -0.1539 (0.00) | **1.0000** | | |
| *LNNUMEST* | 0.2747 (0.00) | -0.0405 (0.23) | -0.0361 (0.28) | -0.2006 (0.00) | 0.1266 (0.00) | 0.2160 (0.00) | -0.0048 (0.89) | 0.7870 (0.00) | -0.1630 (0.00) | -0.1364 (0.00) | 0.1892 (0.00) | -0.0280 (0.41) | -0.0362 (0.28) | 0.1297 (0.00) | 0.1171 (0.00) | 0.2725 (0.00) | -0.4029 (0.00) | **1.0000** | |
| *STDFC* | 0.0142 (0.67) | 0.0383 (0.26) | -0.0444 (0.19) | -0.1182 (0.00) | 0.0668 (0.05) | 0.0945 (0.00) | -0.0239 (0.48) | 0.4947 (0.00) | 0.0525 (0.00) | -0.0352 (0.29) | 0.4238 (0.00) | -0.0135 (0.69) | -0.0240 (0.48) | -0.0174 (0.60) | 0.2245 (0.00) | 0.2040 (0.00) | -0.1897 (0.00) | 0.4702 (0.00) | **1.0000** |

**Notes:**
Table 3 presents the Pearson correlation coefficients. Two-tailed p-values are presented in parentheses. All variables are defined in the Appendix.

**Table 4** Results of the association between ownership structure and forecast accuracy

| Variables | Expected sign | Coefficient | | t-statistics |
|---|---|---|---|---|
| *MANAG* | +/- | 0.02105 | *** | 2.89 |
| *FAM* | +/- | 0.00474 | | 0.75 |
| *INST* | +/- | 0.00222 | | 0.29 |
| *BANK* | +/- | 0.01150 | | 1.26 |
| *HERFINDAHL* | +/- | 0.00653 | | 0.49 |
| *LNTA* | + | 0.00109 | | 0.29 |
| *LOSS* | - | -0.06038 | *** | -6.15 |
| *LAGLOSS* | - | -0.02755 | ** | -2.51 |
| *EARNSURP* | - | -0.00274 | | -1.65 |
| *LEVERAGE* | +/- | 0.03316 | * | 1.76 |
| *GROWTH* | - | -0.01637 | | -1.36 |
| *OCF* | +/- | -0.09806 | *** | -2.78 |
| *ZSCORE* | +/- | -0.01883 | *** | -4.40 |
| *BIG4* | +/- | 0.00447 | | 0.71 |
| *HORIZON* | - | -0.00039 | *** | -2.61 |
| *LNNUMEST* | + | 0.01733 | *** | 3.61 |
| *STDFC* | - | -0.00587 | | -0.35 |
| **Firm Years** | | 886 | | |
| **Adj. $R^2$** | | 0.3576 | | |

**Notes:**
Table 4 presents the results of estimating Eq. (1). The dependent variable is the negative of the absolute value of the difference between the median of forecasted earnings per share and actual earnings per share, scaled by the stock price at the beginning of the fiscal year. Coefficients and t-statistics are based on ordinary least square regressions that include fixed effects for fiscal year, industry and country. The analyses employ heteroskedasticity-adjusted robust standard errors clustered by firm. The regression is estimated with an intercept included (not tabulated). ***, **, and * denote p-value significance at the 1%, 5%, and 10% levels, with two-tailed tests. All variables are defined in the Appendix.

**Table 5** Results of the association between ownership structure, accounting quality, and forecast accuracy

| Variables | Expected sign | Coefficient | | t-statistics |
|---|---|---|---|---|
| *\|DA\|* | - | -0.31070 | *** | -3.50 |
| *MANAG* | +/- | 0.01989 | *** | 2.66 |
| *FAM* | +/- | 0.00460 | | 0.74 |
| *INST* | +/- | -0.00124 | | -0.17 |
| *BANK* | +/- | 0.02054 | ** | 1.99 |
| *HERFINDAHL* | +/- | 0.01005 | | 0.79 |
| *LNTA* | + | -0.00119 | | -0.34 |
| *LOSS* | - | -0.04520 | *** | -4.63 |
| *LAGLOSS* | - | -0.02738 | ** | -2.55 |
| *EARNSURP* | - | -0.00162 | | -1.17 |
| *LEVERAGE* | +/- | 0.02896 | | 1.57 |
| *GROWTH* | - | -0.00945 | | -0.79 |
| *OCF* | +/- | -0.09276 | *** | -2.81 |
| *ZSCORE* | +/- | -0.01772 | *** | -4.45 |
| *BIG4* | +/- | 0.00496 | | 0.82 |
| *HORIZON* | - | 0.00496 | *** | -2.83 |
| *LNNUMEST* | + | 0.01915 | *** | 4.54 |
| *STDFC* | - | -0.00616 | | -0.37 |
| **Firm Years** | | 886 | | |
| **Adj. $R^2$** | | 0.4030 | | |

**Notes:**
Table 5 presents the results of estimating Eq. (2). The dependent variable is the negative of the absolute value of the difference between the median of forecasted earnings per share and actual earnings per share, scaled by the stock price at the beginning of the fiscal year. Coefficients and t-statistics are based on ordinary least square regressions that include fixed effects for fiscal year, industry and country. The analyses employ heteroskedasticity-adjusted robust standard errors clustered by firm. The regression is estimated with an intercept included (not tabulated). ***, **, and * denote p-value significance at the 1%, 5%, and 10% levels, with two-tailed tests. All variables are defined in the Appendix.

**Table 6** Direct and indirect associations of ownership structure and forecast accuracy

| **Path** | **Total** | | **Direct** | | | **Indirect** | | |
|---|---|---|---|---|---|---|---|---|
| **Variables** | **Coefficient** | **t-statistics** | **Coefficient** | **t-statistics** | **Percentage** | **Coefficient** | **t-statistics** | **Percentage** |
| *\|DA\|* | -0.2444 *** | -8.72 | -0.2444 *** | -8.72 | 100 | - | - | - |
| *MANAG* | 0.0606 ** | 2.16 | 0.0568 ** | 2.11 | 93.76 | 0.0038 | 0.49 | 6.24 |
| *BANK* | 0.0199 | 0.65 | 0.0514 * | 1.73 | 62.00 | -0.0315 *** | -3.39 | 38.00 |
| **Firm Years** | 886 | | 886 | | | 886 | | |

**Notes:**

Table 6 presents the results of estimating path analysis.***, **, and * denote p-value significance at the 1%, 5% and 10% levels, with two-tailed tests. All variables are defined in the Appendix.

**Table 7** Sensitivity analyses on the association between ownership strcuture, accounting quality, and forecast accuracy estimating change models

**Panel A**

| Variables | Expected sign | Coefficient | t-statistics |
|---|---|---|---|
| $\|DA\|_{change}$ | - | -0,32256 ** | -2,56 |
| $MANAG_{change}$ | +/- | 0,31497 * | 1,94 |
| $FAM_{change}$ | +/- | 0,01177 | 0,42 |
| $INST_{change}$ | +/- | -0,04605 | -1,31 |
| $BANK_{change}$ | +/- | -0,00452 | -0,19 |
| $HERFINDAHL_{change}$ | +/- | -0,00874 | -0,37 |
| $LNTA_{change}$ | + | 0,00751 | 0,37 |
| $EARNSURP_{change}$ | - | -0,00208 | -0,78 |
| $LEVERAGE_{change}$ | +/- | 0,02966 | 0,52 |
| $GROWTH_{change}$ | - | -0,00127 | -0,08 |
| $OCF_{change}$ | +/- | -0,07623 | -1,46 |
| $ZSCORE_{change}$ | +/- | -0,02496 *** | -2,83 |
| $HORIZON_{change}$ | - | -0,00022 | -1,28 |
| $LNNUMEST_{change}$ | + | 0,03994 *** | 3,79 |
| $STDFC_{change}$ | - | -0,03452 | -1,57 |
| **Firm Years** | | 600 | |
| **Adj. $R^2$** | | 0,1812 | |

**Panel B**

| Variables | Coefficient | t-statistics |
|---|---|---|
| $\|DA\|_{lagged\ change}$ | -0,34740 *** | -2,61 |
| $MANAG_{lagged\ change}$ | 0,21315 | 1,27 |
| $FAM_{lagged\ change}$ | -0,01697 | -0,77 |
| $INST_{lagged\ change}$ | -0,03205 | -1,49 |
| $BANK_{lagged\ change}$ | 0,03388 * | 1,97 |
| $HERFINDAHL_{change}$ | 0,00856 | 0,50 |
| $LNTA_{change}$ | 0,00385 | 0,16 |
| $EARNSURP_{change}$ | -0,00169 | -0,59 |
| $LEVERAGE_{change}$ | 0,03614 | 0,62 |
| $GROWTH_{change}$ | -0,00798 | -0,39 |
| $OCF_{change}$ | -0,08159 | -1,51 |
| $ZSCORE_{change}$ | -0,02247 *** | -2,61 |
| $HORIZON_{change}$ | -0,00018 | -0,81 |
| $LNNUMEST_{change}$ | 0,03975 *** | 3,57 |
| $STDFC_{change}$ | -0,04708 ** | -1,99 |
| **Firm Years** | 540 | |
| **Adj. $R^2$** | 0,1765 | |

**Notes:**
Panel A of Table 7 presents the results of estimating Eq. (3). Panel B presents the results of estimating Eq. (3) using lagged changes with regard to the ownership variables. The dependent variable is the change of the negative of the absolute value of the difference between the median of forecasted earnings per share and actual earnings per share, scaled by the stock price at the beginning of the fiscal year. Coefficients and t-statistics are based on ordinary least square regressions that include fixed effects for industry. The analyses employ heteroskedasticity-adjusted robust standard errors clustered by firm. The regressions are estimated with an intercept included (not tabulated). ***, **, and * denote p-value significance at the 1%, 5% and 10% levels, with two-tailed tests. All variables are defined in the Appendix.

**Table 8** Sensitivity analyses on the association between ownership structure, accounting quality, and forecast accuracy using the percentage of ownership

| Variables | Expected sign | Coefficient | t-statistics |
|---|---|---|---|
| *\|DA\|* | - | -0.31585 *** | -3.52 |
| *MANAG%* | +/- | 0.16937 *** | 4.58 |
| *FAM%* | +/- | 0.01043 | 0.96 |
| *INST%* | +/- | 0.00014 | 0.01 |
| *BANK%* | +/- | 0.03286 | 1.40 |
| *HERFINDAHL* | +/- | 0.00927 | 0.72 |
| *LNTA* | + | -0.00095 | -0.27 |
| *LOSS* | - | -0.04481 *** | -4.57 |
| *LAGLOSS* | - | -0.02707 ** | -2.54 |
| *EARNSURP* | - | -0.00157 | -1.14 |
| *LEVERAGE* | +/- | 0.02908 | 1.61 |
| *GROWTH* | - | -0.00919 | -0.76 |
| *OCF* | +/- | -0.09381 *** | -2.83 |
| *ZSCORE* | +/- | -0.01751 *** | -4.44 |
| *BIG4* | +/- | 0.00576 | 0.92 |
| *HORIZON* | - | -0.00044 *** | -2.94 |
| *LNNUMEST* | + | 0.01916 *** | 4.51 |
| *STDFC* | - | -0.00660 | -0.40 |
| **Firm Years** | | 886 | |
| **Adj. $R^2$** | | 0.4027 | |

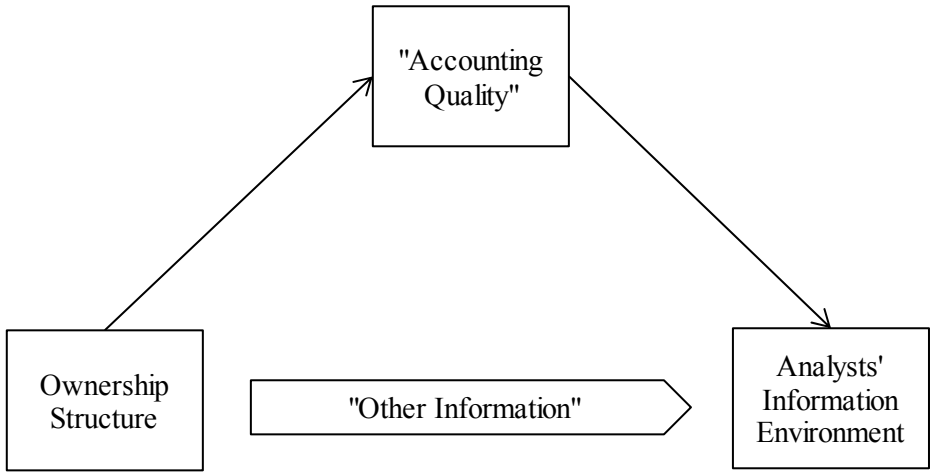
**Notes:**
Table 8 presents the results of estimating Eq. (2) using the percentage of ownership. The dependent variable is the negative of the absolute value of the difference between the median of forecasted earnings per share and actual earnings per share, scaled by the stock price at the beginning of the fiscal year. Coefficients and t-statistics are based on ordinary least square regressions that include fixed effects for fiscal year, industry and country. The analyses employ heteroskedasticity-adjusted robust standard errors clustered by firm. The regression is estimated with an intercept included (not tabulated). ***, **, and * denote p-value significance at the 1%, 5%, and 10% levels, with two-tailed tests. All variables are defined in the Appendix.

**Table 9** Sensitivity analyses on the association between ownership struture, accounting quality, and forecast accuracy using the period of the financial crisis (2008 through 2009)

| Variables | Expected sign | Coefficient | t-statistics |
|---|---|---|---|
| *\|DA\|* | - | -0.32868 ** | -2.52 |
| *MANAG* | +/- | 0.22366 *** | 3.81 |
| *FAM* | +/- | 0.03193 * | 1.72 |
| *INST* | +/- | 0.03190 | 1.59 |
| *BANK* | +/- | 0.04625 ** | 2.19 |
| *HERFINDAHL* | +/- | 0.04826 ** | 2.46 |
| *LNTA* | + | 0.00381 | 0.75 |
| *LOSS* | - | -0.05601 *** | -3.63 |
| *LAGLOSS* | - | -0.04170 ** | -2.06 |
| *EARNSURP* | - | -0.00321 | -1.20 |
| *LEVERAGE* | +/- | 0.04181 | 1.36 |
| *GROWTH* | - | -0.02569 | -1.13 |
| *OCF* | +/- | -0.10907 ** | -2.11 |
| *ZSCORE* | +/- | -0.02226 *** | -3.88 |
| *BIG4* | +/- | -0.00176 | -0.16 |
| *HORIZON* | - | -0.00050 ** | -2.12 |
| *LNNUMEST* | + | 0.01396 ** | 2.16 |
| *STDFC* | - | -0.01598 | -0.75 |
| **Firm Years** | | 372 | |
| **Adj. $R^2$** | | 0.4573 | |

**Notes:**
Table 9 presents the results of estimating Eq. (2) for firm-years which refer to the period of the financial crisis (2008 through 2009). The dependent variable is the negative of the absolute value of the difference between the median of forecasted earnings per share and actual earnings per share, scaled by the stock price at the beginning of the fiscal year. Coefficients and t-statistics are based on ordinary least square regressions that include fixed effects for fiscal year, industry and country. The analyses employ heteroskedasticity-adjusted robust standard errors clustered by firm. The regression is estimated with an intercept included (not tabulated). ***, **, and * denote p-value significance at the 1%, 5%, and 10% levels, with two-tailed tests. All variables are defined in the Appendix.

**Figure 1** Direct and indirect (mediated by accounting quality) effects of ownership structure on the analysts' information environment



# Teil 3: Foreign Ownership and Audit Fees: Does the Legal Origin of the Foreign Owner and the Firm Matter?


**SUMMARY**

This paper investigates whether foreign ownership affects audit fees by analyzing shareholdings of the biggest individual foreign owners in firms from ten European countries (Austria, Belgium, Denmark, Germany, Ireland, Italy, the Netherlands, Norway, Spain, and the United Kingdom) from 2005-2012. The results show that foreign ownership is positively associated with audit fees. This is consistent with the notion that foreign owners are at an information disadvantage and are, therefore, willing to pay higher audit fees for increased audit effort in order to increase the reliability of the firm's financial numbers. The results also show that the positive association between foreign ownership and audit fees is driven by the quality of the shareholder protection system of the biggest individual foreign owner's home country (i.e., common-law vs. civil-law origin). In fact, the positive association between foreign ownership and audit fees is mainly driven by foreign owners from countries with strong shareholder protection. I find, however, no clear evidence suggesting that the quality of the shareholder protection system of the country in which the firm is located also shapes the relationship between foreign ownership and audit fees.

## Contents

# 1 Introduction

Within the European Union, foreign ownership has dramatically increased over the past few years. Due primarily to the liberalization of many capital markets, foreign ownership has become an increasingly important source of financing (Bekaert et al. 2002). A recent report of the European Commission shows that, despite the growing importance of emerging economies as hosts to foreign-owned firms, the European Union is still the largest recipient of foreign capital.[1] Nevertheless, although foreign ownership as a source of external financing is increasingly significant, yet its implications for the audit market are largely unexplored.[2]

According to Jensen and Meckling (1976), the audit by an external auditor is a key instrument to mitigate agency problems between management and owners. Foreign owners often face heightened agency problems. Foreign owners are seen as unprivileged in terms of information gathering and management monitoring, especially due to their geographical distance from their firms. Several studies support this view by providing evidence that foreign owners are at an information disadvantage compared to their domestic peers (Brennan and Cao 1997; Kang and Stulz 1997; Choe et al. 2005; Leuz et al. 2009; Kang and Kim 2010; Choi et al. 2013). Foreign owners, therefore, rely heavily on additional controls that enable them to effectively monitor and evaluate their invest-

1 The report of the European Commission is available at: http://ec.europa.eu/economy_finance/international/globalisation/fdi/index_en.htm

2 A recent literature review by Hay et al. (2006), which summarizes a large body of literature on audit fee determinants, corroborates the view that previous research has offered only scarce evidence of how ownership structure impacts audit fees. While several studies have conclusively demonstrated a negative association between managerial ownership and audit fees (e.g., O'Sullivan 2000; Gul and Tsui 2001; Peel and Clatworthy 2001; Gul et al. 2003; Nikkinen and Sahlstroem 2004; Niemi 2005; Mitra et al. 2007; Ali and Lesage 2010), the results of the few studies on the association between non-managerial ownership and audit fees are mixed and inconclusive (e.g., Chan et al. 1993; Ezzamel et al. 1996; Firth 1997; Carcello et al. 2002; Ezzamel et al. 2002; Goddard and Masters 2002; Whisenant et al. 2003; Khan et al. 2011; Adelopo et al. 2012; Ali and Lesage 2013). Niemi (2005) and Nelson and Mohamed-Rusdi (2015) have investigated foreign ownership's impact on audit fees. Both studies, among others, have found foreign ownership positively impacts audit fees. Desender et al. (2013b) investigate the association between foreign ownership and corporate governance patterns. Among others, the authors find a positive effect of foreign ownership on audit fees.

ments. Against this background, the first objective of this paper is to investigate how foreign ownership affects audit fees. Thereby, I argue that foreign owners require more extensive auditing procedures and are, consequently, more willing to pay higher fees in order to effectively compensate for the heightened agency problems inherent in their ownership.

Prior research notes that incentives of owners and auditors may differ according to the quality of the underlying investor protection system (Shleifer and Vishny 1997; Francis et al. 2003; Choi and Wong 2007; Choi et al. 2008; Francis and Wang 2008; Choi et al. 2009). For instance, as investor protection systems strengthen, the cost of an audit may increase, as the financial reporting requirements become more demanding. In addition, auditors may become more sensitive to the cost of client misreporting and its effect on auditor reputation as investor protection regimes become stricter. As such, auditors are likely to demand higher audit fees for increased audit effort in order to enforce higher earnings quality (Francis and Wang 2008). While La Porta et al. (1998) find that investor protection is stronger in common-law countries than in civil-law countries, corresponding to the aforementioned, prior studies provide evidence for higher audit fees and higher audit quality in common-law countries (Francis et al. 2003; Choi et al. 2008; Francis and Wang 2008; Choi et al. 2009).[3]

I argue that foreign owners from countries with strong investor protection may internalize the importance of auditing as an effective control mechanism from their "home country" and then promote it by means of an increased demand for audit services for their firm investments.[4] As a consequence, I expect audit fees to be relatively higher when the largest owner is a foreigner from a common-law country rather than a civil-

[3] Although the common-law vs. civil-law dichotomy is simplistic, previous research confirms that it is associated with more refined measures of investor protection. Please refer to La Porta et al. (2006), Francis and Wang (2008), Djankov et al. (2008), and Kaufmann et al. (2009).

[4] This line of argumentation follows Aggarwal et al. (2011). Please refer to Section 2.1 for a detailed discussion.

law country. In addition, the demand for audit services by foreign owners from common-law countries may also vary with the system of legal origin in which the firm investment is located. For example, foreign owners from common-law countries may demand more audit services for their firm investments in those countries with a weak investor protection system in order to protect their firm investments from client misreporting in an auditor's low liability regime (e.g., Hess et al. 2015). In contrast, foreign owners from common-law countries may demand relatively more audit services when the firm investment is located in a common-law country rather than a civil-law country because of auditing's importance in a country with strong investor protection. Furthermore, the regulatory requirements in common-law countries are likely to be so demanding that the audit fees in those countries will always be higher than those in civil-law countries. Against this background, the second objective of the present paper is to examine whether the expected relationship between foreign ownership and audit fees is shaped by the quality of the investor protection system in which the firm investment and/or the foreign owner is located.

For my analyses, I use data from non-financial firms with IFRS financial information available in the *Thomson Reuters Worldscope Database* from ten European countries (Austria, Belgium, Denmark, Germany, Ireland, Italy, the Netherlands, Norway, Spain, and the United Kingdom) from 2005-2012. Audit fee data was obtained from the *EUR-Business Research Database*. Information on the proportion of holdings by foreign owners was taken from the *BvD Amadeus Database*. To obtain my results, I first estimate an audit fee model based on prior research (e.g., Simunic 1980; Hay et al. 2006) and incorporate an indicator variable when the biggest individual owner is a for-

eigner in order to examine the effect of foreign ownership on audit fees.[5] In a second step, I differentiate between the effect of foreign ownership from common-law countries and civil-law countries. Finally, I analyze whether the legal origin of the firm investment also shapes the relationship between foreign ownership (i.e., from common-law vs. civil law countries) and audit fees.

My evidence supports my hypothesis that foreign ownership is significantly positively associated with audit fees. This result indicates that foreign owners, due to their weakened monitoring capabilities given their geographical separation, have a higher demand for extensive auditing procedures, and are, therefore, more willing to pay higher audit fees for a statutory auditor relative to their domestic peers. My results also show that the positive association between foreign ownership and audit fees is mainly driven by foreign owners from countries with a strong investor protection system. Thus, it can be shown that foreign owners whose home country has a strong investor protection system especially increase audit effort as a monitoring mechanism, which consequently drives up audit fees. Finally, I find no clear evidence that the quality of the investor protection system of the country where the firm is located also shapes the relationship between foreign ownership and audit fees.

My study makes several contributions to the existent literature. First, it adds to the international evidence on the impact of ownership structure on audit fees (Chan et al. 1993; Ezzamel et al. 1996; Firth 1997; O'Sullivan 2000; Gul and Tsui 2001; Peel and Clatworthy 2001; Carcello et al. 2002; Ezzamel et al. 2002; Goddard and Masters 2002; Gul et al. 2003; Whisenant et al. 2003; Nikkinen and Sahlström 2004; Niemi 2005; Mitra et al. 2007; Ali and Lesage 2010; Khan et al. 2011; Adelopo et al. 2012; Ali and Lesage 2013; Nelson and Mohamed-Rusdi 2015). I, thereby, demonstrate that the

[5] I acknowledge that foreign ownership may be measured differently (e.g., blockholdings, percentage held by all foreigners, etc). However, focusing on the ownership as measured by the largest shareholder provides a cleaner setting to investigate my research questions and test my hypotheses.

firm's ownership structure is an important factor in determining audit pricing. Second, I focus on a particular ownership type – foreign ownership. Considering foreign ownership directly enables me to investigate both (1) foreign ownership's impact on audit fees, taking into account the role played by the legal origin of the foreign owner's home country and (2) the impact of foreign ownership on audit fees and its interrelation with the system of legal origin of the firm. To the best of my knowledge, no prior evidence exists on how different legal systems impact the relationship between foreign ownership and audit fees. My study, the first to explore how the origin of ownership affects audit fees in an international setting, thus highlights the importance of taking institutional context into account when explaining cross-national differences in audit fees. Third, little research on the Continental European audit market has been done. Investigating the impact on audit fees by foreign owners from ten European countries (Austria, Belgium, Denmark, Germany, Ireland, Italy, the Netherlands, Norway, Spain, and the United Kingdom) adds to close that research gap and, therefore, contributes to the emerging European audit fee research. Finally, I add empirical evidence to the research on the impact of ownership structure on corporate governance. Several studies provide evidence that the firm's ownership structure is associated with the design and effectiveness of the firm's implemented corporate governance system (e.g., Desender 2009; Aggarwal et al. 2011; Desender et al. 2013a; Desender et al. 2013b). Those studies demonstrate that the assessment of the design and effectiveness of the firm's corporate governance system must also be examined with regard to the firm's ownership structure. Since auditing is an important instrument of enhancing the protection of investors' rights and represents an important aspect of corporate governance, this study adds to this stream of research.

The remainder of this paper is organized as follows. The following Section 2 discusses theory, develops hypotheses, and sets up the research design. Section 3 discusses the sample composition and presents the empirical results. The final section 4 provides a summary and contains my conclusion.

# 2 Theory, Hypotheses, and Research Design

## 2.1 Theory and Hypotheses

According to agency theory, potential opportunistic behavior by a firm's management is a main concern of the firm's owners. Although the threat of opportunistic behavior by the management and the related need for effective control of it by the owner is innate to all firms, both aspects are likely more pronounced in foreign-owned firms. Foreign owners are seen as unprivileged in terms of information gathering and management monitoring, especially due to their geographical distance from their firms and unfamiliarity with the predominant institutional conditions there. Several studies support this view by showing that foreign owners have an information disadvantage about a local firm compared to their domestic peers (Brennan and Cao 1997; Kang and Stulz 1997; Choe et al. 2005; Leuz et al. 2009; Kang and Kim 2010; Choi et al. 2013). Foreign owners, therefore, strongly prefer firms geographically near their home market (Ferreira and Matos 2008). As it is commonly thought that they are at an information disadvantage and are limited in their ability to effectively monitor the management, foreign owners face heightened agency problems. Nevertheless, firm owners need high-quality financial information in order to mitigate the information asymmetries between themselves and the management to appropriately manage their investments (Kothari 2000). Here, an external auditor serves as an appropriate instrument to mitigate such information asymmetries and the corresponding agency problems. Jensen and Meckling (1976) argue that an independent audit is an important type of monitoring that helps to

reduce the incentive problems that arise when a firm's management does not own all of the firm's residual claims. Because foreign owners, for the reasons mentioned, are limited in their capacity to effectively control the firm's management by themselves, it can be expected that they will be particularly reliant on auditing by an external auditor in order to increase the reliability of the firm's financial numbers. Accordingly, I expect a higher demand for extensive auditing procedures among foreign owners than domestic ones and, therefore, a greater willingness to pay higher audit fees for a statutory auditor. To test for the foreign owner effect on audit fees, I posit the following hypothesis:

**Hypothesis (1):** Foreign ownership is positively associated with audit fees.

Prior research notes that the incentive structures of owners and auditors differ according to the quality of the underlying system of legal origin (Shleifer and Vishny 1997; Francis et al. 2003; Choi and Wong 2007; Choi et al. 2008; Francis and Wang 2008; Choi et al. 2009). Systems of legal origin are generally placed into two broad categories: common-law and civil-law. In a series of papers, La Porta et al. in particular investigate the differences in laws and their enforcement between common-law and civil-law systems. Beyond that, La Porta et al. also try to explain how those differences are reasonable for the structure and development of firms and financial markets across countries. In their seminal paper, La Porta et al. (1998) document a high correlation between the common-law/civil-law dichotomy and investor protection. They show that the legal system is a fundamental factor in determining the nature and enforcement of investor protection laws across countries. They find that common-law countries (as a whole) have the strongest investor protection systems. French civil-law countries were to be found to have the weakest investor protection systems, with German and Scandinavian civil-law countries falling in the middle. In several related studies, La Porta et al. further show that strong investor protection in common-law countries is associated with

more developed financial markets, greater external finance opportunities, higher levels of outside (minority) ownership, higher firm valuation, and more widespread ownership (La Porta et al. 1997, 1998, 1999, 2000a, 2000b, 2002).[6] As widespread ownership is found to be more pronounced in common-law countries, separation of ownership and control and the resulting firm-level agency problems are expected to be greater in countries with strong investor protection systems (La Porta et al. 2000b; Francis et al. 2003). It is, therefore, reasonable that the demand for extensive auditing procedures and resulting fees for a statutory auditor are higher in common-law countries. For instance, as investor protection systems and, thus, financial reporting requirements become more demanding, the cost of an audit may increase. As investor protection regimes become stricter, auditors may also become more sensitive to the cost of client misreporting and its effect on auditor reputation, and are, accordingly, likely to demand higher audit fees to compensate for the increased audit effort to enforce higher earnings quality (Francis and Wang 2008). Although research on cross-country variations in audit fees has been scarce, a few studies supporting this view by providing evidence for higher audit fees and higher audit quality in common-law countries (e.g., Francis et al. 2003; Choi et al. 2008; Francis and Wang 2008; Choi et al. 2009).

Nevertheless, whether the legal system of the foreign owner's country of origin, and, therefore, its system-specific demand for audit services also shape the relationship between foreign ownership and firm-level audit fees remains an empirical question. A recent study by Aggarwal et al. (2011) indicates that such "spillover-effects" do actually exist. By investigating the impact of institutional ownership on corporate governance, the authors find evidence that foreign institutional owners, particularly ones based in

[6] Previous research has also shown that strong investor protection is associated with greater financial transparency (Bhattacharya et al. 2003; Bushman et al. 2004), less managed earnings, and more value-relevant earnings (Ball et al. 2000; Hung 2000; Leuz et al. 2003). The above-mentioned summary of La Porta et al.'s findings is in conformity with the one of Francis et al. (2003).

countries with strong investor protection (common-law countries), are the main drivers of governance improvements outside the U.S., while institutions from countries with poor investor protection (civil-law countries) are not. The authors conclude that there is a positive association between firm-level governance and "governance at home" of foreign institutional owners holding a firm's stock. In conjunction, I hypothesize that such "spillover-effects" also exist when investigating the impact of foreign ownership on audit fees. More precisely, I argue that foreign owners from countries with strong investor protection may internalize the importance of auditing as an effective control mechanism from their "home-country" and then promote it, resulting in an increased demand for audit services for their firm investments.[7] As such, I hypothesize a greater willingness of foreign owners from common-law countries than foreign owners from civil-law counties to pay substantial audit fees for a statutory auditor in order to effectively monitor the management because of their different investor protection systems. I, therefore, posit the following hypothesis:

**Hypothesis (2):** The positive association between foreign ownership and audit fees is mainly driven by foreign owners from common-law countries rather than by foreign owners from civil-law countries.

The demand for audit services by foreign owners from common-law countries may also vary based on the system of legal origin in which the firm investment is located. For example, foreign owners from common-law countries may demand more audit services for their firm investments in those countries with a weak investor protection

[7] This line of argumentation follows Aggarwal et al. (2011). Investigating cross-border mergers, Bris et al. (2008) and Bris and Cabolis (2008) confirm the arguments of Aggarwal et al. (2011) by providing evidence that improved corporate governance depends heavily on the legal system of the acquirers' home country. Thus, it can be shown that firms acquired by firms from countries with strong investor protection (i.e. common-law countries) have improved corporate governance at the firm level, while firms acquired by firms from countries with weak investor protection (i.e. civil-law countries) do not.

system in order to shield their firm investments from client misreporting in an auditor's low liability regime (e.g., Hess et al. 2015).[8] In contrast, foreign owners from common-law countries may demand relatively more audit services when the firm investment is located in a common-law country rather than a civil-law country. The auditor's effort is a function not only of the client's size and complexity but also of the auditor's risk. Auditors should, therefore, respond by increasing audit effort in an auditor's high liability regime (Hess et al. 2015).[9] Because foreign owners are aware of the importance of auditing in a country with strong investor protection, demand for audit services is higher when investing in a common-law country than a civil-law country. Furthermore, the regulatory requirements in common-law countries are likely to be so demanding that the audit fees in those countries will always be higher than in civil-law countries. Ultimately, I cannot make a clear prediction how the demand of foreign owners from common-law countries varies based on the system of legal origin in which the firm investment is located. I, therefore, posit the following hypothesis:

**Hypothesis (3):** The positive (ambiguous) association between foreign ownership from common-law (civil-law) countries and audit fees is shaped by the quality of the investor protection system in which the firm investment is located.

## 2.2 Research Design

To test my hypotheses, I use the following ordinary least squares regressions, extending the traditional audit fee model (e.g., Simunic 1980; Hay et al. 2006) to include my variables of interest.

(1) $Total\ Audit\ Fees = f\ (FOSH, Controls)$

[8] Hess and Stefani (2012) provide an overview of the strength of legal liability regimes in 29 countries. The overview shows that civil-law countries more often have restricted liability regimes than common-law countries.

[9] Please refer to footnote 8.

(2) $Total\ Audit\ Fees = f\ (FOSH\_COMMON, FOSH\_CIVIL, Controls)$

(3) $Total\ Audit\ Fees = f\ (FOSH\_COMMON, FOSH\_CIVIL, COMMON^{\#}, FOSH\_COMMON * COMMON^{\#}, Controls)$

Following previous audit fee studies, I define total audit fees as the natural log of audit fees (LNFEE). Eq. (1) tests Hypothesis (1) and captures the effect of foreign ownership (FOSH) on audit fees. Eq. (2) tests Hypothesis (2) by discriminating between foreign ownership from common-law countries (FOSH_COMMON) and civil-law countries (FOSH_CIVIL), respectively. Finally, Eq. (3) tests Hypothesis (3) and sheds light on whether the positive (ambiguous) association between foreign ownership from common-law (civil-law) countries and audit fees is shaped by the quality of the investor protection system in which the firm investment is located. All of my ownership variables are indicator variables. Those variables take the value of 1 when the biggest individual owner is a foreign owner (FOSH), and respectively, with regard to FOSH_COMMON and FOSH_CIVIL, also comes from a common-law or civil-law country. I refer to the biggest individual owner to provide a clean setting to test my hypotheses and because this is where the exercise of influence is expected to be the strongest. For a detailed description of all variables used in my regression, including the described control variables below, please refer to the Appendix.[10]

Consistent with prior empirical audit fee studies, a number of independent control variables are added to the model. Previous literature (e.g., Craswell et al. 1995; DeFond et al. 2002; Gul et al. 2003; Hay et al. 2006; Choi et al. 2010; Krauss et al. 2014)

[10] In order to classify foreign owners into either common-law countries or civil-law countries, I refer to the framework of La Porta et al. (1998). According to this framework, a foreign owner is assigned to common-law, if the country of origin is Australia, Canada, Hong Kong, India, Ireland, Israel, Kenya, Malaysia, New Zealand, Nigeria, Pakistan, Singapore, South Africa, Sri Lanka, Thailand, the United Kingdom, the United States, or Zimbabwe, whereas a foreign owner is assigned to civil-law, if the country of origin is Argentina, Belgium, Brazil, Chile, Colombia, Ecuador, Egypt, France, Greece, Indonesia, Italy, Jordan, Mexico, the Netherlands, Peru, Philippines, Portugal, Spain, Turkey, Uruguay, Venezuela, Austria, Germany, Japan, South Korea, Switzerland, Taiwan, Denmark, Finland, Norway, or Sweden. In contrast to La Porta et al. (1998), I consider civil-law countries as a group.

identifies three major audit engagement-specific factors as the main drivers of demand for audit services: *client size*, *client complexity*, and *audit engagement-specific risk* (i.e., both the risk of the client and the auditor). *Client size* is probably the most commonly used and most decisive factor in determining audit fees. The existing literature provides broad evidence of audit fees being positively associated with firm size (e.g., Simunic 1980; Hay et al. 2006; Hoitash et al. 2007; Choi et al. 2010; Eshleman and Guo 2014; Krauss et al. 2014). I, therefore, add LNTA to the models. To control for *client complexity* I add LNSEG, LNINVREC, and FOREIGN to the models (Simunic 1980; Hay et al. 2006; Choi et al. 2008; Choi et al. 2010). It has been shown that demand for audit services is positively affected by the complexity of the clients' business. Variables LEVERAGE, LOSS, ROE, GROWTH, and BTM are incorporated to control for *client-specific risk*. Due to financial problems of financially distressed clients, the litigation risk of the auditor is higher than for their financially healthy counterparts. To compensate for this increased risk, the auditor is expected to demand higher audit fees (Simunic 1980; Pratt and Stice 1994; Simunic and Stein 1996; Hay et al. 2006; Eshleman and Guo 2014; Krauss et al. 2014). To capture this fact, I add LEVERAGE, LOSS, and ROE to the models. Previous literature has shown that audit fees systematically differ between high-growth and low-growth firms (Reynolds et al. 2004; Hay et al. 2006; Choi and Wong 2007; Choi et al. 2010; Krauss et al. 2014). Because high-growth firms are deemed to have a healthy business environment, they are often seen as less risky for the auditor. Due to this more moderate risk, the auditor is expected to charge lower audit fees. Nevertheless, fast-growing firms in particular face significant changes to their business organization and related accounting system. This would lead to a greater demand for audit services, and, therefore, higher audit fees (Krauss et al. 2014). To control for the audit fee differentiation between high-growth and low-growth firms, I, therefore,

add GROWTH and BTM to the model. To control for the *auditor-specific risk*, I add BIG4 to the model. Prior literature shows a high correlation between the large audit firm/small audit firm dichotomy and audit fees (e.g., Hay et al. 2006). BIG4 auditors generally enjoy high reputational status. The risk of reputational damages in case of audit failures is, therefore, heightened for these auditors. To protect themselves from reputational damage, BIG4 auditors are, therefore, expected to deliver enhanced audit quality and consequently ask fee-premiums from their clients. Several studies are in line with that view and provide evidence that BIG4 auditors positively affect both audit fees and audit quality (DeAngelo 1981; Palmrose 1986a; Craswell et al. 1995; Ireland and Lennox 2002). I also add NAS and BUSY to the model. NAS is added to control for the effect of non-audit services on audit fees (Simunic 1984; Palmrose 1986b; Whisenant et al. 2003). On the one hand, it is argued that knowledge spillovers and synergy effects may arise when a statutory auditor provides additional non-audit services, which could lead to a more efficient audit and, thus, lower audit fees (Hay et al. 2006; Joe and Vanderwelde 2007; Quick and Warming-Rasmussen 2009). On the other, it is also conceivable that the provision of non-audit services may affect the design and complexity of a firm's organization. Because the auditor needs detailed knowledge of the firm's organization to perform an audit, the auditor must expend more effort gaining a deeper understanding of the organization, which ultimately leads to higher audit fees (Simunic 1984; Turpen 1990; Hay et al. 2006). Finally, BUSY is added to the model to control for the specific audit pricing during the busy season (Hay et al. 2006; Mitra et al. 2009; Krauss et al. 2014).

Eq. (1) – (3) are estimated using a pooled sample of 6,920 firm-year observations including industry-fixed effects in accordance with the definition of Frankel et al. (2002), year-fixed effects, and country-fixed effects to control for potential hetereogene-

ity of industry, year, and country. To control for heteroscedasticity the analysis further employs heteroscedasticity-adjusted robust standard errors clustered by firm.

# 3 Sample and Empirical Analyses

## 3.1 Sample Composition

My analyses use data from non-financial firms with IFRS consolidated financial statements from ten European countries from 2005-2012. Audit-related variables were taken from the *EUR-Business Research Database*. The *EUR-Business Research Database* is an independent provider of audit-related information for European firms from ten countries currently.[11] Financial data was obtained from the *Thomson Reuters Worldscope Database*. Finally, I used the *Amadeus Database* to get detailed information on the proportion of holdings by foreign owners and their country of origin. *Amadeus* is a database of *Bureau van Dijk Electronic Publishing*. In addition to financial data, *Amadeus* contains information about the firm's ownership structure, including the names of owners, their respective ownership share, and the owners' country of origin.[12] In accordance with prior research, I excluded all financial firms corresponding to the SIC codes 6000-6999, because their accounts and audit process significantly differ. The initial sample thus consists of 2,440 firms and 13,699 firm-year observations for which financial data and audit fee data were available. After merging the financial data and audit fee data with ownership data, I omit 6,087 firm-year observations due to missing data and 692 firm-year observations due to missing required control variables. This leaves a final sample of 1,697 firms and 6,920 firm-year observations, respectively. Panel A of Table 1 summarizes the sample adjustments mentioned above and shows

[11] The *EUR Business Research Database* is available online at: http://www.eur-businessresearch.com/

[12] *Amadeus* collects information from a wide variety of sources: (1) directly from the firm's annual reports, (2) from official bodies, (3) from press releases, (4) from regulatory authorities, and (5) from the associated information provider (e.g. *Verband der Vereine Creditreform* for Germany).

the final sample composition. Panel B presents the yearly distribution of firm observations, whereas Panel C gives an overview of the distribution of firm-year observations according to Frankel et al.'s (2002) industry classification. Finally, Panel D provides the distribution of firm-year observations across my ten sample countries.

**[Table 1]**

## 3.2 Descriptive Statistics and Univariate Analyses

The descriptive statistics of the variables used in this study are presented in Table 2. To effectively control for outliers, all continuous variables are winsorized at the 1-percent level and, respectively, 99-percent level. With regard to the distribution of variables shown in Table 2, it is worth noting the following facts. Delogging the variables LNFEE, LNTA, and LNSEG on the individual firm-year level shows that the average (median) firm in the sample paid audit fees of 631 k€ (205 k€), has total assets of € 2,952 Mio. (€ 264 Mio.), and operates in 3.7 (4.0) business segments. Other noteworthy aspects of the sample composition are an average (median) sales growth (GROWTH) of 17.0 (6.0) %, an average (median) return on equity (ROE) of 0.8 (8.8) %, and an average (median) book-to-market ratio (BTM) of 98.0 (68.5) %. Finally, it can be seen that the average (median) firm in the sample spends 29.9 (28.1) % of total fees paid to the current auditor for non-audit services (NAS). With regard to my binary variables, it can be shown that more than one fourth (26.9 %) of the sample composition consists of firms in which the biggest individual owner comes from a foreign country (FOSH). This descriptive figure is in line with a recent report by the European Commission and illustrates that the European Union is a large recipient of foreign capital and that foreign capital plays an important role in corporate financing.[13] It is also worth highlighting that

[13] The report by the European Commission is available at: http://ec.europa.eu/economy_finance/international/globalisation/fdi/index_en.htm

73.8 % of the audit engagements in the sample are audited by a BIG4 auditor. This descriptive figure illustrates that four large international audit firms (*KPMG, PwC, Deloitte, and Ernst & Young*) dominate the European audit market. Finally, it can be seen that 88.9 % of the sample have international operations (FOREIGN), and 24.3 % of the sample composition report a negative net income in the sample period (LOSS).

**[Table 2]**

Table 3 and Figure 1 show the market share of foreign owners, which is the within-country portion of the number of observations when the biggest individual owner comes from a foreign country (blue bar). The red bar (green bar) shows the corresponding portion of total assets (paid audit fees). It can be seen that especially Belgium (33 %), Ireland (73 %), and the United Kingdom (38 %) account for high market shares of foreign biggest individual owners. The corresponding amount of total assets even goes beyond these numbers (Belgium: 69 %; Ireland: 93 %; United Kingdom: 69 %). In line with previous literature, this descriptive figure illustrates that foreign owners strongly prefer the stocks of large firms (e.g., Ferreira and Matos 2008).[14] Nevertheless, this does not seem to be true for all sample countries. Total assets especially in Austria (6 %) and Norway (10 %) lie considerably below the market share of foreign owners (Austria: 18 %; Norway: 20 %). The within-country portion of audit fees almost corresponds to the within-portion of total assets, corroborating the well-known fact that firm size is a determining factor of audit fees.

**[Figure 1]**

**[Table 3]**

[14] Because my sample contains only 75 firm-year observations from Ireland, the respective descriptive statistics may not be representative. To eliminate potential concern that the ownership structure of Irish firms drives my multivariate results, I re-estimated all regressions excluding Irish firms. The results remained qualitatively unchanged.

Table 4 and Figure 2 show the within-country distribution of the number of observations with a biggest individual foreign owner by legal origin. At the bottom of Table 4, it can be seen that of my 6,920 sample-observations, a total of 1,862 observations have a biggest individual foreign owner. Of these, 830 (1,032) foreign owners come from a common-law (civil-law) country, which corresponds to 45 (55) % of all observations with a biggest individual foreign owner. In six of my ten sample countries, it can be seen that biggest individual owners from common-law countries account for more than one fourth of observations, including Germany (29 %), Ireland (82 %), the Netherlands (46 %), Norway (37 %), Spain (30 %), and the United Kingdom (56 %).[15] Nevertheless, in all countries except Ireland and the United Kingdom, the number of individual foreign owners from civil-law countries with the biggest share in the firm exceeds that of owners from common-law countries.

**[Figure 2]**

**[Table 4]**

Table 5 presents the Pearson correlation matrix of the variables used Eq. (1) – (3). It can be seen that foreign ownership (FOSH) is significantly positive correlated with my audit fee variable LNFEE ($\rho = 0.1698$). This significant correlation is independent of the system of legal origin of the foreign owner's home country – FOSH_COMMON ($\rho = 0.1924$) and FOSH_CIVIL ($\rho = 0.0359$). In addition, the majority of the control variables correlate significantly with the dependent variable, suggesting a multivariate analysis in order to discriminate their effects on the level of audit fees. With regard to the correlations between the control variables used in my analyses, it is worth noting the following: First, LNTA is significantly correlated with LNSEG ($\rho = 0.3538$), LNINVREC ($\rho = 0.8983$), LEVERAGE ($\rho = 0.3830$) and BIG4 ($\rho =$

[15] With regard to the descriptive statistics for Ireland, please refer to footnote 14.

0.4000). These correlations suggest that large firms operate in more business segments, balance higher values of inventories and receivables, are more highly leveraged, and are more likely to hire a BIG4 auditor than a small or mid-sized firm. Second, it can be seen that LNINVREC is significantly correlated with LNSEG (ρ = 0.3958), LEVERAGE (ρ = 0.4417), BIG4 (ρ = 0.3649), FOREIGN (ρ = 0.3310) and LOSS (ρ = - 0.3149). These correlations highlight the obvious fact that firms with high values of balanced inventories and receivables operate in more business segments, are more highly leveraged, are more likely to hire a Big 4 auditor and to have international operations, and are less likely to report a negative net income. Finally, Table 5 shows a significantly negative correlation between ROE and LOSS (ρ = - 0.5391). In order to eliminate potential concern with respect to multicollinearity, I compute the variance inflation factors which lie between 1 and 6 for all regression models used in this study, indicating no multicollinearity problems.[16]

**[Table 5]**

Table 6 shows the results of univariate comparison of audit fees within different groups of observations.[17] Panel A of Table 6 reports the mean values of audit fees for each group of my predefined foreign ownership variable (FOSH = 1; FOSH = 0). As can be seen, audit fees of foreign-owned firms (LNFEE = 5.8075) are systematically higher than those of domestic-owned firms (LNFEE = 5.3107). From the results of the parametric two-sample t-test and non-parametric Mann-Whitney U-test, it can be seen that the null hypothesis that the group means are equal is rejected at the 1 % significance level, indicating that foreign owners require higher audit effort and consequently higher audit fees than their domestic peers. Panel B of Table 6 reports the mean values

[16] With regard to the high correlation between LNTA and LNINVREC (ρ = 0.8983), I re-estimated all regression models used in this study without incorporating either LNTA or LNINVREC. The results remained qualitatively unchanged.

[17] In accordance with my multivariate analyses, audit fees are calculated by taking the natural log of audit fees (LNFEE).

of audit fees for each group of my predefined foreign ownership variable (FOSH = 1; FOSH = 0) by additionally differentiating between the system of legal origin of the foreign owner's home country (common* = 1; common* = 0).[18] As can be seen, audit fees are the highest for foreign owners from common-law countries (LNFEE = 6.1207). It exceeds the value of audit fees of foreign owners from civil-law countries (LNFEE = 5.5557) by LNFFE = 0.5650. Again, the parametric two-sample t-test and non-parametric Mann-Whitney U-test reject the null hypothesis that the group means are equal at the 1 % significance level, indicating that foreign owners from common-law countries require greater audit effort and consequently pay higher audit fees than their peers from civil-law countries. Finally, Panel C of Table 6 reports the mean values of audit fees for foreign owners from common-law countries (FOSH_COMMON = 1), civil-law countries (FOSH_CIVIL = 1), and domestic owners (DOMESTIC = 1) by additionally differentiating between the system of legal origin in which the firm investment is located (common# = 1; common# = 0).[19] As can be seen, audit fees are the highest for foreign owners from common-law countries investing in a common-law country (LNFEE = 6.2268). These fees exceeds those of foreign owners from common-law countries investing in a civil-law country (LNFEE = 5.8471) by LNFFE = 0.3797. Moreover, both the parametric two-sample t-test and non-parametric Mann-Whitney U-test provide evidence that the group means significantly differ at the 1 % significance level. Taken together, the results of the univariate analyses support my expectations and hypotheses, respectively. In the next section, I, therefore, conduct multivariate analyses to investigate the robustness of my preliminary findings.

**[Table 6]**

[18] With regard to the variable definition of common*, please refer to the Appendix.
[19] With regard to the variable definition of common#, please refer to the Appendix.

## 3.3 Multivariate Analyses

Column (1) of Table 7 presents the results obtained by estimating Eq. (1). It can be seen that foreign ownership is significantly positively associated with audit fees. With regard to the economic significance of my finding, the positive coefficient of FOSH ($Coef_{FOSH}$ = 0.07212) implies that audit fees are 7.5 % (i.e., the exponentiated value of 0.07212) higher for foreign owners than for domestic owners, *ceteris paribus*. This result suggests that foreign owners, due to their weakened monitoring capabilities given their geographical separation, require more extensive auditing procedures and are, therefore, more willing to pay higher audit fees for a statutory auditor than their domestic peers. With regard to the control variables, it can be seen that 11 out of 12 variables are significantly associated with the dependent variable LNFEE. Moreover, the coefficient signs of all variables are in line with my expectations and prior research (e.g. Hay et al. 2006). The results thus show that, for the European audit market, LNFEE is significantly positively associated with LNTA, LNSEG, LNINVREC, LEVERAGE, BIG4, BUSY, and LOSS, while a significantly negative correlation is observable for GROWTH, ROE, BTM, and NAS.

Column (2) of Table 7 presents the results obtained by estimating Eq. (2). As can be seen, a significant positive association between the biggest individual foreign owners and audit fees is only observable for foreign owners from common-law countries. Moreover, a Wald test, reported at the bottom of column (2), rejects the null hypothesis of equality of FOSH_COMMON and FOSH_CIVIL. The results suggest that the willingness to pay substantial audit fees for a statutory auditor in order to monitor the management effectively depends on the system of legal origin of the foreign owner's home country. Thus, the biggest individual foreign owners especially increase audit

effort as a monitoring mechanism and, consequently, audit fees, if the foreign owner's home country has a strong investor protection system.

Column (3) of Table 7 presents the results obtained by estimating Eq. (3). The negative interaction of FOSH_COMMON and COMMON$^{\#}$ highlights that the effect of the biggest individual foreign owners from common-law countries on audit fees varies based on the system of legal origin in which the firm investment is located. Hence, foreign owners from common-law countries impact audit fees less when the firm investment is located in a country with strong investor protection (i.e., common-law). This result contradicts the result of my univariate analysis provided in Table 6, but, as can be seen from the results of Table 7, the interaction term is not significant.

**[Table 7]**

These results do not change when I conduct a subsample analysis. Table 8 shows the results of conducting subsample analysis. Column (1) thereby shows the results by considering observations when the firm investment is located in common-law countries, whereas column (2) shows the corresponding results for observations when the firm investment is located in civil-law countries. As can be seen, both the coefficient and the significance level of FOSH_COMMON are higher for firm investments located in countries with weak investor protection ($Coef_{common\text{-}law}$ = 0.07594**; $Coef_{civil\text{-}law}$ = 0.17785***). This result suggests that demand for audit services by foreign owners from countries with strong investor protection may additionally heightened when firm investments are located in countries with a weak investor protection system. Nevertheless, the results of testing for the equality of the two coefficients provide no evidence that they significantly differ. Therefore, with regard to Hypothesis (3), I find no clear evidence that the quality of the investor protection system of the country in which the

firm investment is located also shapes the relationship between foreign ownership and audit fees.

**[Table 8]**

## 3.4 Sensitivity Analyses

To strengthen the reliability of my results, I perform a wide variety of additional sensitivity analyses.

First, as it is commonly thought that foreign owners are at an information disadvantage compared to their domestic peers, it can be argued that foreign owners are associated with firms with *a priori* low information asymmetry. More precisely, it is reasonable to assume that firms with higher audit fees and, therefore, better monitoring may be more likely to attract foreign owners. To address this problem of reversed causality, I re-estimate Eq. (1) – (3) by using lagged ownership variables.[20] Therefore, if audit fees are for period *t*, each of the foreign ownership variables is measured at period *t-1*. This enables me to test for the direction of the relationship by examining the relation between foreign ownership and future audit fees. Columns (1) – (3) of Table 9 show the results of re-estimating Eq. (1) – (3) by using lagged ownership variables. As can be seen here, the results remain qualitatively unchanged.[21]

**[Table 9]**

I further test for the association between changes in foreign ownership and changes in audit fees. Because my ownership variables are indicator variables that refer to the biggest individual foreign owner, an upward (downward) change in foreign ownership is present when in period *t-1* the firm's ownership structure is initially character-

[20] By calculating my lagged variables, I omit 1,733 firm-year observations due to missing information for the prior year. This leaves a sample of 5,187 firm-year observations for which I re-estimate my main models.

[21] I also re-estimate Eq. (1) – (3) by lagging all explanatory variables. The results (not tabulated) are qualitatively similar.

ized by a biggest individual domestic (foreign) owner but then changes to an ownership structure characterized by a biggest individual foreign (domestic) owner in period *t*. Untabulated results do not confirm my findings by showing a positive yet insignificant effect of upward changes in foreign ownership from common-law countries on changes in audit fees. Nevertheless, in accordance with my theory, the results show a significantly negative correlation between downward changes in foreign ownership from common-law countries and changes in audit fees.[22] To eliminate any remaining concern about the direction of the relationship, I perform a causality analysis in the spirit of Granger (1969). In accordance to Granger (1969), an independent variable *x* is "granger-causal" for a dependent variable *y*, if the explanation of *y* in consideration of lagged values of *y* can be improved by adding lagged values of *x*. I correspondingly estimate the following two regression models:

$$(4)\ Total\ Audit\ Fees = f\ (LNFEE_{t-1}, LNFEE_{t-2}, FOREIGN\ OWNERSHIP_{t-1}, FOREIGN\ OWNERSHIP_{t-2}, Controls)$$

$$(5)\ Total\ Audit\ Fees = f\ (LNFEE_{t-1}, LNFEE_{t-2}, Controls)$$

After estimating the two regressions, I perform PROC IML in SAS to read the residuals of each regression into vectors used to calculate test statistics with matrix algebra.[23] Untabulated results provide strong evidence that foreign ownership from common-law countries causes an increase in audit fees and not vice versa.

Second, several studies provide evidence that foreign investors strongly prefer the stocks of large firms (Dahlquist and Robertsson 2001; Gompers and Metrick 2001; Ferreira and Matos 2008). Thus, it is reasonable that my foreign ownership variables also contain a size effect. Because client size, in turn, is a major audit fee determinant, it

[22] A closer look to the dataset reveals that my foreign ownership variables are relatively sticky. That makes it difficult to get a sufficient number of observations for which I can identify changes in foreign ownership. Therefore, the results provided by estimating my change model have only limited explanatory power.

[23] This SAS procedure is available at: http://support.sas.com/rnd/app/examples/ets/granger/

is not unlikely that my results are driven by this latent size effect rather than the reasons mentioned in Section 2.1. Indeed, in my analyses, I controlled for potential size effects by adding LNTA to the regressions. Additionally, the Pearson correlations between my ownership variables and LNTA are moderate.[24] Nevertheless, in order to eliminate any remaining concern regarding this issue, I re-estimate Eq. (1) – (3), following Simunic (1984) and Abbott et al. (2003), by regressing size-adjusted audit fees on my explanatory variables. The results are reported in Table 10. From column (1) – (3) it can be seen that the coefficients of my foreign ownership variables decrease compared to the results provided in Table 7. The coefficients, nevertheless, remain statistically significant. Therefore, the results are largely consistent with my main analysis. I further subdivide my sample into small firms, mid-sized firms, and large firms and re-estimate my regressions in Eq. (1) – (3) separately for each of the three groups.[25] Untabulated results do not confirm my findings in the group of small firms, yet for mid-sized firms and large firms, I find almost identical results.

**[Table 10]**

Third, in classifying foreign ownership to either common-law or civil-law countries, I referred to the framework of La Porta et al. (1998), which is common in international accounting research. Nevertheless, to strengthen the reliability of my findings, I further use the worldwide governance indicators of Kaufmann et al. (2009) to create an alternative measure for country-level institutional quality.[26] Therefore, I calculate the

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24 Please refer to Table 5.

25 Small (mid-sized) firms refer to observations for which assets are < 25$^{th}$ (>= 25$^{th}$ and < 75$^{th}$) percentile. Large firms refer to observations for which assets are >= 75$^{th}$ percentile. For the corresponding values of the percentiles, please refer to Table 2.

26 Kaufmann et al. (2009) report six worldwide governance indicators for 212 countries which represent aggregates of hundreds of specific disaggregated individual variables measuring various dimensions of governance taken from 35 data sources provided by 33 different organizations. The data reflect the views of governance of public sector, private sector, and non-government experts, as well as thousands of citizen and company survey respondents worldwide. The six worldwide governance indicators presented in Kaufman et al. (2009) are (1) voice and accountability, (2) political stability and ab-

average of four indicators (i.e., the rule of law, control of corruption, government effectiveness, and regulatory quality) presented in Kaufmann et al. (2009) and then assign the foreign owner's home countries to *high* institutional quality countries when the average worldwide governance indicator lies above the median and to *low* institutional quality countries when the average worldwide governance indicator lies below the median.[27] In accordance with my theoretical explanation, I expect foreign owners from countries with high institutional quality to be the main drivers of audit fees. Untabulated results are in line with that expectation, showing a positive and significant impact on audit fees by the biggest individual foreign owners from high institutional quality countries.[28]

Fourth, all regression models used in this study measure the effect of foreign ownership on audit fees by using ownership dummies. An obvious alternative is to derive a relation between the percentage of foreign ownership and audit fees. Columns (1) – (3) of Table 11 show the results obtained by using the percentage of foreign ownership of the biggest individual owner. It can be seen that the effects on audit fees are qualitatively similar to those, I obtained by incorporating ownership dummies.[29]

**[Table 11]**

Finally, considering my sample composition in Panel D of Table 1, it is worth noting that about 60 % of my sample firms come from Germany and the United Kingdom. Germany and the United Kingdom are the biggest and most important economies

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sence of violence and terrorism, (3) rule of law, (4) control of corruption, (5) government effectiveness, and (6) regulatory quality.

27 The sample median of the average of the four worldwide governance indicators of Kaufmann et al. (2009) amounts to 1.62454.

28 The Kaufman et al. (2009) study reports worldwide governance indicators only for 1996-2008. For the remaining years of my sample period (2009-2012), I therefore obtain corresponding indicators from the official webpage: http://info.worldbank.org/governance/wgi/index.aspx#home

29 I also consecutively re-estimate Eq. (1) – (3) for the following threshold levels with regard to my biggest foreign ownership dummy: 5 %, 10 %, 15 %, 20 %, 25 %, 50 %. Untabulated results show that the effect of foreign ownership on audit fees remains qualitatively unchanged for all threshold levels.

in Europe.[30] Consequently, it is reasonable that firms from these countries particularly appeal to foreign investors. To eliminate potential concern that my results are driven by firms from these countries, and are, therefore, not generalizable, I re-estimate Eq. (1) – (3) excluding firms from Germany and the United Kingdom. Untabulated results show that the effect of foreign ownership on audit fees remains qualitatively unchanged.

## 4 Conclusion

Previous research provides only limited evidence of how different forms of ownership and systems of legal origin affect audit fees across firms and countries. The present study tries to overcome that lack of research by investigating the impact of foreign ownership on audit fees and its interrelation with the quality of the investor protection system in which the firm investment and/or the foreign owner is located. Using a sample of 6,920 firm-year observations from 2005-2012, my empirical results demonstrate that foreign ownership is significantly positively associated with audit fees. Therefore, foreign owners increase the demand for extensive auditing procedures, thus driving up audit fees, in order to effectively compensate for the heightened agency problems inherent in their ownership. Nevertheless, my results also show that the positive association between foreign ownership and audit fees depends on the system of legal origin of the foreign owner's home country (common-law vs. civil-law). Thus, it can be shown that foreign owners from common-law countries drive the positive association between foreign ownership and audit fees. This result suggests that foreign owners from countries with strong investor protection (common-law countries) may internalize the importance of auditing as an effective control mechanism from their "home-country" and then promote it by means of an increased demand for audit services for their firm

[30] An overview of the gross domestic product of countries in the European Union is available at: http://de.statista.com/statistik/daten/studie/188776/umfrage/bruttoinlandsprodukt-bip-in-den-eu-laendern/

investments. Finally, I find no clear evidence that the quality of the investor protection system of the country in which the firm investment is located also shapes the relationship between foreign ownership and audit fees. To the best of my knowledge, no evidence exists on how different legal systems impact the relationship between foreign ownership and audit fees. My study, therefore, is the first to explore how the origin of ownership affects audit fees in an international setting.

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## **Appendix** Variable definitions

| Variable | Description |
|---|---|
| *DOMESTIC* | - Indicator variable that takes the value of 1, if the biggest individual owner is a domestic owner, 0 otherwise |
| *BIG4* | - Indicator variable that takes the value of 1, if the audit company is either KPMG, PwC, Deloitte or Ernst & Young, 0 otherwise |
| *BTM* | - Book-to-market ratio (total book value of equity divided by firms' market capitilization) |
| *BUSY* | - Indicator variable that takes the value of 1, if the fiscal year ends in December, 0 otherwise |
| *COMMON*$^{\#}$ | - Indicator variable that takes the value of 1, if the firm investments' home country is a common-law country, 0 otherwise |
| *COMMON*$^{*}$ | - Indicator variable that takes the value of 1, if the foreign owners' home country is a common-law country, 0 otherwise |
| *FOREIGN* | - Indicator variable that takes the value of 1, if the company has foreign operations (foreign sales), 0 otherwise |
| *FOSH* | - Indicator variable that takes the value of 1, if the biggest individual owner is a foreign owner, 0 otherwise |
| *FOSH_CIVIL* | - Indicator variable that takes the value of 1, if the biggest individual owner is a foreign owner and is located in a civil-law country, 0 otherwise |
| *FOSH_COMMON* | - Indicator variable that takes the value of 1, if the biggest individual owner is a foreign owner and is located in a common-law country, 0 otherwise |
| *GROWTH* | - Sales change from the prior to the current fiscal year |
| *LEVERAGE* | - Total liabilities divided by total assets |
| *LNFEE* | - Natural log of audit fees |
| *LNINVREC* | - Natural log of the sum of inventories and receivables |
| *LNSEG* | - Natural log of the number of business segments |
| *LNTA* | - Natural log of total assets |
| *LOSS* | - Indicator variable that takes the value of 1, if the current year's net income before extraordinary items is negative, 0 otherwise |
| *NAS* | - Ratio of non-audit fees to total fees |
| *ROE* | - Return on Equity (net income before extraordinary items divided by total equity) |

## **Table 1** Sample description

Panel A: Sample selection process

| **Sample selection steps** | **Firm-years** | **Firms** |
|---|---|---|
| *Initial sample* - European listed firms having IFRS financial information available in the *Thomson Reuters Worldscope Database* and audit fee data available in the *EUR Business Research Database* (2005-2012); excluding SIC Codes 6000-6999 | 13,699 | 2,440 |
| *less:* Merging the financial data and audit fee data with foreign ownership data | 6,087 | |
| *less:* Missing control variables | 692 | |
| Final study sample | 6,920 | 1,697 |

Panel B: Firm observations by year

| **Year** | **Firms** | **%** |
|---|---|---|
| *2005* | 288 | 4% |
| *2006* | 439 | 6% |
| *2007* | 871 | 13% |
| *2008* | 1,015 | 15% |
| *2009* | 1,067 | 15% |
| *2010* | 1,127 | 16% |
| *2011* | 1,173 | 17% |
| *2012* | 940 | 14% |

## **Table 1 (continued)** Sample description

Panel C: Firm-year observations by Industry

| **Industry classification** | **Firm-years** | **%** |
|---|---|---|
| *Agriculture (SIC Codes 100-999)* | 69 | 1% |
| *Mining and construction (SIC Codes 1000-1999, excl. 1300-1399)* | 513 | 7% |
| *Food (SIC Codes 2000-2111)* | 356 | 5% |
| *Textiles and printing/publishing (SIC Codes 2200-2799)* | 511 | 7% |
| *Chemicals (SIC Codes 2800-2824, 2480-2899)* | 215 | 3% |
| *Pharmaceuticals (SIC Codes 2830-2836)* | 222 | 3% |
| *Extractive (SIC Codes 2900-2999. 1300-1399)* | 328 | 5% |
| *Durable manufacturers (SIC Codes 3000-3999, excl. 3570-3579 and 3670-3679)* | 1.574 | 23% |
| *Transportation (SIC Codes 4000-4899)* | 559 | 8% |
| *Utilities (SIC Codes 4900-4999)* | 275 | 4% |
| *Retail (SIC Codes 5000-5999)* | 628 | 9% |
| *Services (SIC Codes 7000-8999, excl. 7370-7379)* | 849 | 12% |
| *Computers (SIC Codes 7370-7379, 3570-3579, 3670-3679)* | 821 | 12% |

Panel D: Firm-Year Observations by Country

| **Country** | **Firm-years** | **%** |
|---|---|---|
| *Austria* | 135 | 2% |
| *Belgium* | 243 | 4% |
| *Denmark* | 291 | 4% |
| *Germany* | 1.524 | 22% |
| *Ireland* | 75 | 1% |
| *Italy* | 682 | 10% |
| *Netherlands* | 305 | 4% |
| *Norway* | 602 | 9% |
| *Spain* | 440 | 6% |
| *United Kingdom* | 2.623 | 38% |

**Notes:**
Panel A of Table 1 presents the sample selection process taken to derive the final study sample. Panel B (Panel C; Panel D) reports the distribution of the sample by year (by industry; by country).

**Table 2** Descriptive statistics

| **Continuous variables** | **Mean** | **Std. Dev.** | **Min** | **Q1** | **Median** | **Q3** | **Max** | **Firm-years** |
|---|---|---|---|---|---|---|---|---|
| *LNFEE* | 5.44436 | 1.29797 | 1.56862 | 4.51229 | 5.31746 | 6.22785 | 9.26861 | 6,920 |
| *LNTA* | 12.63921 | 2.06402 | 6.83626 | 11.16591 | 12.48292 | 13.98973 | 19.00981 | 6,920 |
| *LNSEG* | 1.21631 | 0.43965 | 0.00000 | 0.69315 | 1.38629 | 1.60944 | 2.07944 | 6,920 |
| *LNINVREC* | 11.12149 | 2.18938 | 2.77259 | 9.69017 | 11.15931 | 12.56414 | 16.02843 | 6,920 |
| *LEVERAGE* | 0.52690 | 0.20914 | 0.00279 | 0.38111 | 0.54832 | 0.68176 | 1.20896 | 6,920 |
| *GROWTH* | 0.17001 | 0.76992 | -0.95840 | -0.04361 | 0.06031 | 0.18666 | 7.75410 | 6,920 |
| *ROE* | 0.00807 | 0.49542 | -4.18030 | 0.00209 | 0.08789 | 0.17043 | 0.84662 | 6,920 |
| *BTM* | 0.98045 | 1.09071 | 0.03934 | 0.38076 | 0.68479 | 1.17817 | 9.55294 | 6,920 |
| *NAS* | 0.29869 | 0.21550 | 0.00000 | 0.12500 | 0.28077 | 0.44330 | 0.85160 | 6,920 |

| **Indicator variables** | **Mean** | **Std. Dev.** | **0** | **1** | **Firm-years** |
|---|---|---|---|---|---|
| *FOSH* | 0.26908 | 0.44351 | 5,058 | 1,862 | 6,920 |
| *FOSH_COMMON* | 0.11994 | 0.32492 | 6,090 | 830 | 6,920 |
| *FOSH_CIVIL* | 0.14913 | 0.35625 | 5,888 | 1,032 | 6,920 |
| *BIG4* | 0.73815 | 0.43967 | 1,812 | 5,108 | 6,920 |
| *BUSY* | 0.74162 | 0.43778 | 1,788 | 5,132 | 6,920 |
| *FOREIGN* | 0.88931 | 0.31378 | 766 | 6,154 | 6,920 |
| *LOSS* | 0.24306 | 0.42896 | 5,238 | 1,682 | 6,920 |

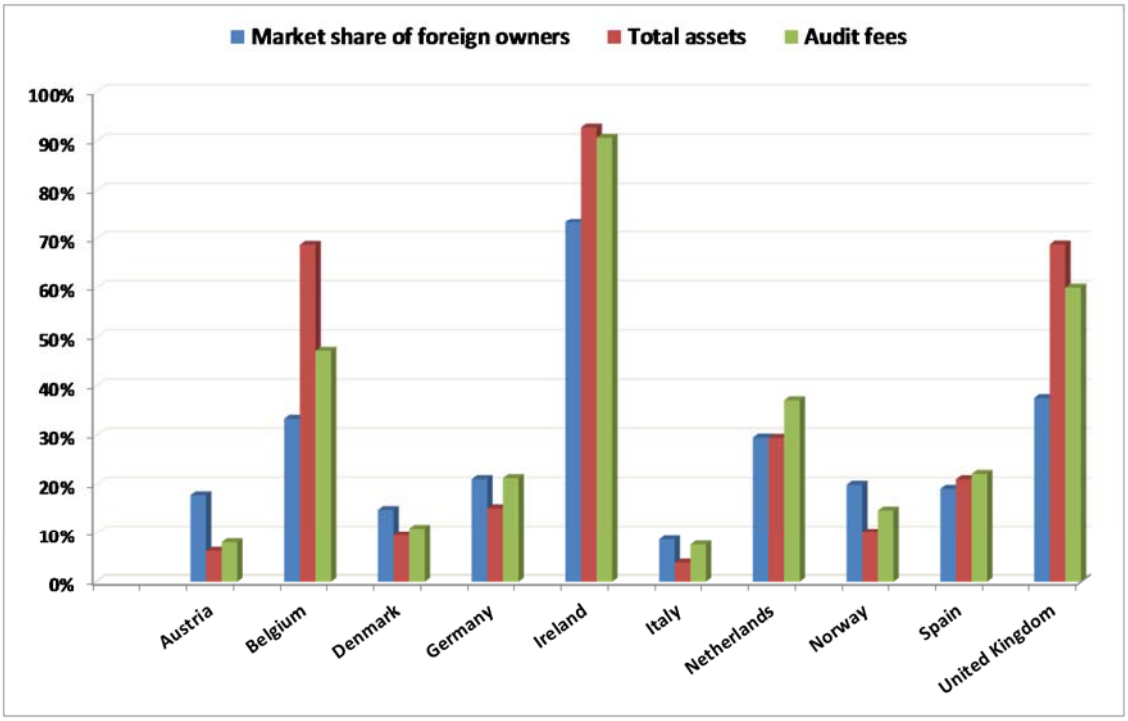
**Notes:**
Table 2 presents the summary statistics of the variables used in my analyses. All variables are defined in the Appendix.

**Table 3** Market share of foreign owners and their respective market share of total assest and audit fees by country

| Country | Market share of foreign owners | Total assets | Audit fees |
|---|---|---|---|
| *Austria* | 18% | 6% | 8% |
| *Belgium* | 33% | 69% | 47% |
| *Denmark* | 15% | 10% | 11% |
| *Germany* | 21% | 15% | 21% |
| *Ireland* | 73% | 93% | 91% |
| *Italy* | 9% | 4% | 8% |
| *Netherlands* | 30% | 29% | 37% |
| *Norway* | 20% | 10% | 15% |
| *Spain* | 19% | 21% | 22% |
| *United Kingdom* | 38% | 69% | 60% |

**Notes:**
Table 3 presents the market share of foreign owners, which is the within-country portion of the number of observations for which the biggest individual owner is a foreigner relative to all observations and their respective portion of total assets and audit fees, respectively.

**Figure 1** Market share of foreign owners and their respective market share of total assest and audit fees by country




**Notes:**
Figure 1 presents the market share of foreign owners, which is the within-country portion of the number of observations for which the biggest individual owner is a foreigner relative to all observations (blue bar). The red bar (green bar) shows the corresponding portion of total assets (paid audit fees).

**Table 4** Within-country distribution of the number of observations with a biggest individual foreign owner by the system of legal origin of the foreign owner's home country

| | n | | % | |
|---|---|---|---|---|
| **Country** | **Common law** | **Civil law** | **Common law** | **Civil law** |
| *Austria* | 4 | 20 | 17% | 83% |
| *Belgium* | 9 | 72 | 11% | 89% |
| *Denmark* | 6 | 37 | 14% | 86% |
| *Germany* | 94 | 227 | 29% | 71% |
| *Ireland* | 45 | 10 | 82% | 18% |
| *Italy* | 9 | 50 | 15% | 85% |
| *Netherlands* | 41 | 49 | 46% | 54% |
| *Norway* | 44 | 76 | 37% | 63% |
| *Spain* | 25 | 59 | 30% | 70% |
| *United Kingdom* | 553 | 432 | 56% | 44% |
| **Aggregated** | **830** | **1,032** | **45%** | **55%** |

**Figure 2** Within-country distribution of the number of observations with a biggest individual foreign owner by the system of legal origin of the foreign owner's home country

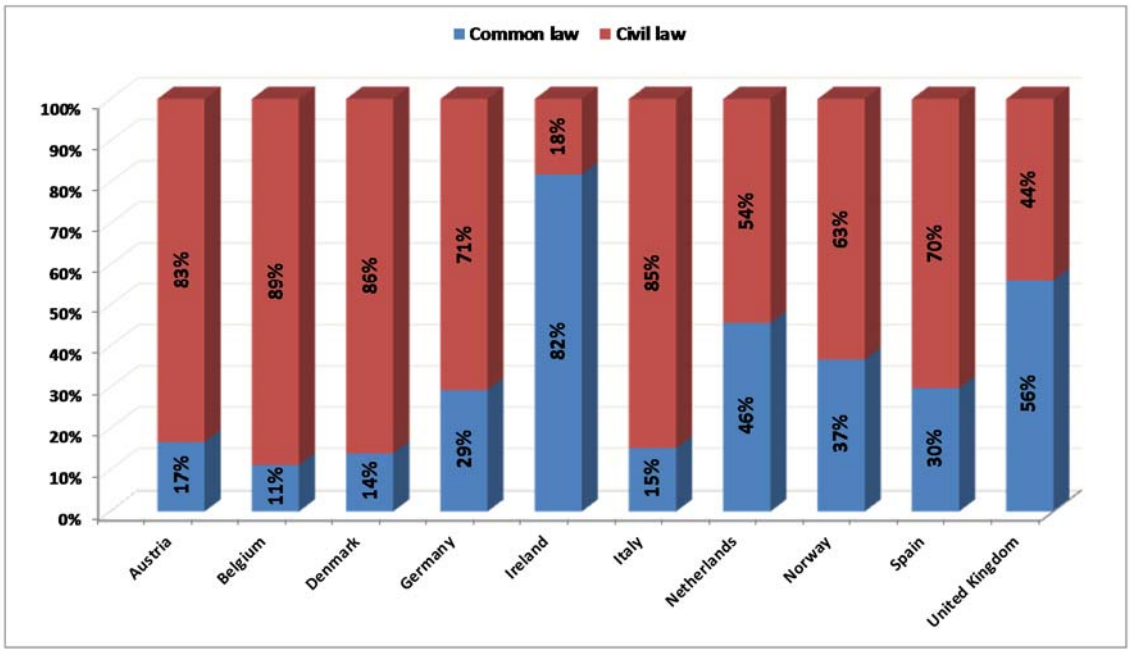


**Table 5** Pearson correlations among regression variables

| | *LNFEE* | *FOSH* | *FOSH_ COMMON* | *FOSH_ CIVIL* | *LNTA* | *LNSEG* | *LN INVREC* | *LEVE RAGE* | *GROWTH* | *ROE* | *BTM* | *NAS* | *BIG4* | *BUSY* | *FOREIGN* | *LOSS* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *LNFEE* | **1.0000** | | | | | | | | | | | | | | | |
| *FOSH* | 0.1698 | **1.0000** | | | | | | | | | | | | | | |
| | (0.00) | | | | | | | | | | | | | | | |
| *FOSH_COMMON* | 0.1924 | 0.6085 | **1.0000** | | | | | | | | | | | | | |
| | (0.00) | (0.00) | | | | | | | | | | | | | | |
| *FOSH_CIVIL* | 0.0359 | 0.6900 | -0.1546 | **1.0000** | | | | | | | | | | | | |
| | (0.00) | (0.00) | (0.00) | | | | | | | | | | | | | |
| *LNTA* | 0.8502 | 0.1478 | 0.1627 | 0.0356 | **1.0000** | | | | | | | | | | | |
| | (0.00) | (0.00) | (0.00) | (0.00) | | | | | | | | | | | | |
| *LNSEG* | 0.3685 | -0.0598 | -0.0318 | -0.0455 | 0.3538 | **1.0000** | | | | | | | | | | |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | | | | | | | | | | | |
| *LNINVREC* | 0.8092 | 0.1095 | 0.1173 | 0.0294 | 0.8983 | 0.3958 | **1.0000** | | | | | | | | | |
| | (0.00) | (0.00) | (0.00) | (0.01) | (0.00) | (0.00) | | | | | | | | | | |
| *LEVERAGE* | 0.3931 | 0.0268 | 0.0149 | 0.0198 | 0.3830 | 0.2398 | 0.4417 | **1.0000** | | | | | | | | |
| | (0.00) | (0.03) | (0.21) | (0.10) | (0.00) | (0.00) | (0.00) | | | | | | | | | |
| *GROWTH* | -0.1129 | -0.0005 | -0.0177 | 0.0155 | -0.0900 | -0.0852 | -0.1316 | -0.0976 | **1.0000** | | | | | | | |
| | (0.00) | (0.97) | (0.14) | (0.20) | (0.00) | (0.00) | (0.00) | (0.00) | | | | | | | | |
| *ROE* | 0.1789 | 0.0218 | 0.0435 | -0.0126 | 0.2510 | 0.1017 | 0.2583 | -0.0654 | 0.0020 | **1.0000** | | | | | | |
| | (0.00) | (0.07) | (0.00) | (0.29) | (0.00) | (0.00) | (0.00) | (0.00) | (0.87) | | | | | | | |
| *BTM* | -0.0582 | -0.0308 | -0.0582 | 0.0147 | 0.0047 | 0.0243 | -0.0066 | -0.0478 | -0.0488 | -0.0503 | **1.0000** | | | | | |
| | (0.00) | (0.01) | (0.00) | (0.22) | (0.69) | (0.04) | (0.58) | (0.00) | (0.00) | (0.00) | | | | | | |
| *NAS* | 0.0536 | 0.0890 | 0.0680 | 0.0489 | 0.1123 | -0.0254 | 0.0362 | 0.0005 | 0.0518 | 0.0116 | -0.0186 | **1.0000** | | | | |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.03) | (0.00) | (0.97) | (0.00) | (0.34) | (0.12) | | | | | |
| *BIG4* | 0.3861 | 0.0412 | 0.0641 | -0.0072 | 0.4000 | 0.1482 | 0.3649 | 0.1817 | -0.0539 | 0.0921 | -0.0349 | 0.1177 | **1.0000** | | | |
| | (0.00) | (0.00) | (0.00) | (0.55) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | | | | |
| *BUSY* | 0.0557 | -0.0721 | -0.0890 | -0.0087 | 0.0963 | 0.1326 | 0.1084 | 0.0496 | 0.0029 | -0.0541 | 0.0465 | -0.0915 | 0.0239 | **1.0000** | | |
| | (0.00) | (0.00) | (0.00) | (0.47) | (0.00) | (0.00) | (0.00) | (0.00) | (0.81) | (0.00) | (0.00) | (0.00) | (0.05) | | | |
| *FOREIGN* | 0.1917 | 0.0178 | -0.0059 | 0.0275 | 0.2282 | 0.1776 | 0.3310 | 0.1830 | -0.0618 | 0.0872 | 0.0335 | -0.0464 | 0.0905 | 0.0769 | **1.0000** | |
| | (0.00) | (0.14) | (0.63) | (0.02) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.01) | (0.00) | (0.00) | (0.00) | | |
| *LOSS* | -0.2058 | -0.0164 | -0.0350 | 0.0115 | -0.2730 | -0.1270 | -0.3149 | -0.0245 | 0.0502 | -0.5391 | 0.1744 | -0.0167 | -0.0617 | 0.0297 | -0.0846 | **1.0000** |
| | (0.00) | (0.17) | (0.00) | (0.34) | (0.00) | (0.00) | (0.00) | (0.04) | (0.00) | (0.00) | (0.00) | (0.16) | (0.00) | (0.01) | (0.00) | |

**Notes:**

Table 5 presents the Pearson correlation coefficients. Two-tailed p-values are presented in parentheses. All variables are defined in the Appendix.

**Table 6** Univariate comparison of audit fees

Panel A: Foreign owners vs. domestic owners

| ***mean LNFEE*** | *= 1* | *= 0* | |
|---|---|---|---|
| | *(a)* | *(b)* | *(a) - (b)* |
| *FOSH* | 5.8075 | 5.3107 | 0.4969 ***/††† |

Panel B: Foreign owners vs. domestic owners by additionally differentiating by the system of legal origin of the foreign owner's home country

| ***mean LNFEE*** | | *COMMON* = 1* | *COMMON* = 0* | |
|---|---|---|---|---|
| | | *(a)* | *(b)* | *(a) - (b)* |
| *FOSH = 1* | *(i)* | 6.1207 | 5.5557 | 0.5650 ***/††† |
| *FOSH = 0* | *(ii)* | 5.1756 | 5.3765 | -0.2009 ***/††† |
| | *(i) - (ii)* | 0.9450 ***/††† | 0.1792 ***/††† | |

Panel C: Foreign owners from common-law countries vs. foreign owners from civil-law countries vs. domestic owners by additionally differentiating by the system of legal origin of the investment country

| ***mean LNFEE*** | | *COMMON# = 1* | *COMMON# = 0* | |
|---|---|---|---|---|
| | | *(a)* | *(b)* | *(a) - (b)* |
| *FOSH_COMMON = 1* | *(i)* | 6.2268 | 5.8471 | 0.3797 ***/††† |
| *FOSH_CIVIL = 1* | *(ii)* | 5.7311 | 5.4242 | 0.3069 ***/††† |
| *DOMESTIC = 1* | *(iii)* | 5.1756 | 5.3765 | -0.2009 ***/††† |
| | *(i) - (ii)* | 0.4957 ***/††† | 0.4229 ***/††† | |
| | *(i) - (iii)* | 1.0512 ***/††† | 0.4706 ***/††† | |
| | *(ii) - (iii)* | 0.5555 ***/††† | 0.0477 † | |

**Notes:**
Table 6 presents the results of univariate comparison of audit fees within different groups of observations. Panel A reports the mean values of audit fees for each group of my predefined foreign ownership variable (FOSH = 1; FOSH = 0). Panel B reports the mean values of audit fees for each group of my predefined foreign ownership variable (FOSH = 1; FOSH = 0) by additionally differentiating between the system of legal origin of the foreign owners' home country (common* = 1; common* = 0). Panel C reports the mean values of audit fess for foreign owners from common-law countries (FOSH_COMMON = 1), civil-law countries (FOSH_CIVIL = 1), and domestic owners (DOMESTIC = 1) by additionally differentiating between the system of legal origin of the firm investment home country (common# = 1; common# = 0). Audit fees are calculated by taking the natural log of audit fees (LNFEE). ***, **, * indicate statistical significance of difference in menas from two-tailed t-test at the 1%, 5%, and 10% levels, respectively. †††, ††, † indicate statistical significance of differences in means at the 1%, 5%, and 10% levels, repectively, based on non-parametric Mann-Whitney U-test. All variables are defined in the Appendix.

**Table 7** Results of the association between foreign ownership and audit fees

| Variables | Expected sign | (1) | (2) | (3) |
|---|---|---|---|---|
| *FOSH* | + | 0.07212 *** | | |
| | | (2.81) | | |
| *FOSH_COMMON* | + | | 0.11340 *** | 0.15521 *** |
| | | | (3.36) | (2.61) |
| *FOSH_CIVIL* | + | | 0.04336 | 0.04264 |
| | | | (1.39) | (1.37) |
| *COMMON*[#] | + | | | 0.70856 *** |
| | | | | (4.37) |
| *FOSH_COMMON*COMMON*[#] | +/- | | | -0.06264 |
| | | | | (-0.89) |
| *LNTA* | + | 0.40440 *** | 0.40302 *** | 0.40374 *** |
| | | (21.97) | (21.87) | (21.89) |
| *LNSEG* | + | 0.19830 *** | 0.19828 *** | 0.19837 *** |
| | | (5.71) | (5.71) | (5.71) |
| *LNINVREC* | + | 0.15521 *** | 0.15544 *** | 0.15513 *** |
| | | (8.54) | (8.53) | (8.52) |
| *LEVERAGE* | + | 0.33812 *** | 0.33904 *** | 0.33751 *** |
| | | (4.17) | (4.18) | (4.16) |
| *GROWTH* | +/- | -0.03472 *** | -0.03420 *** | -0.03419 *** |
| | | (-3.29) | (-3.24) | (-3.24) |
| *ROE* | - | -0.07331 *** | -0.07370 *** | -0.07358 *** |
| | | (-3.31) | (-3.34) | (-3.33) |
| *BTM* | +/- | -0.06065 *** | -0.05999 *** | -0.06004 *** |
| | | (-5.37) | (-5.29) | (-5.29) |
| *NAS* | +/- | -0.49737 *** | -0.49428 *** | -0.49609 *** |
| | | (-9.04) | (-8.98) | (-8.99) |
| *BIG4* | + | 0.11511 *** | 0.11504 *** | 0.11478 *** |
| | | (3.61) | (3.61) | (3.60) |
| *BUSY* | + | 0.09875 *** | 0.09791 *** | 0.09861 *** |
| | | (2.78) | (2.76) | (2.77) |
| *FOREIGN* | + | -0.03049 | -0.02952 | -0.02818 |
| | | (-0.66) | (-0.64) | (-0.61) |
| *LOSS* | + | 0.15763 *** | 0.15696 *** | 0.15727 *** |
| | | (6.12) | (6.09) | (6.11) |
| Wald-test: | | | 11.30 | |
| (p-value) | | | (0.00) | |
| **Firm Years** | | 6,920 | 6,920 | 6,920 |
| **Adj. $R^2$** | | 0.7967 | 0.7968 | 0.7973 |

**Notes:**
Column (1) of Table 7 pesents the results of estimating Eq. (1), column (2) presents the results of estimating Eq. (2), and column (3) presents the results of estimating Eq. (3). The dependent variable in columns (1), (2), and, respectively, (3) is the natural log of audit fees (LNFEE). Coefficients and t-statistics (in parentheses) are based on ordinary least square regressions that include fixed effects for fiscal year, industry, and country. The analyses employ heteroskedasticity-adjusted robust standard errors clustered by firm. The regression is estimated with an intercept included (not tabulated). ***, **, and * denote p-value significance at the 1%, 5%, and 10% levels, with two-tailed tests. All variables are defined in the Appendix.

**Table 8** Results of the association between foreign ownership and audit fees conducting subsample analysis

| Variables | Expected sign | (1) | (2) |
|---|---|---|---|
| *FOSH_COMMON* | + | 0.07594 ** | 0.17785 *** |
| | | (2.00) | (2.93) |
| *FOSH_CIVIL* | + | 0.01337 | 0.06010 |
| | | (0.33) | (1.37) |
| *LNTA* | + | 0.39179 *** | 0.42957 *** |
| | | (16.97) | (15.32) |
| *LNSEG* | + | 0.20749 *** | 0.17657 *** |
| | | (4.39) | (3.65) |
| *LNINVREC* | + | 0.18011 *** | 0.12365 *** |
| | | (7.65) | (4.48) |
| *LEVERAGE* | + | 0.37450 *** | 0.27500 ** |
| | | (3.44) | (2.41) |
| *GROWTH* | +/- | -0.00544 | -0.06128 *** |
| | | (-0.45) | (-3.51) |
| *ROE* | - | -0.06342 ** | -0.08159 *** |
| | | (-2.05) | (-2.58) |
| *BTM* | +/- | -0.07379 *** | -0.05106 *** |
| | | (-4.80) | (-3.38) |
| *NAS* | +/- | -0.40239 *** | -0.54804 *** |
| | | (-5.93) | (-6.63) |
| *BIG4* | + | 0.10394 ** | 0.12922 *** |
| | | (2.32) | (2.95) |
| *BUSY* | + | 0.11640 *** | 0.05395 |
| | | (2.88) | (0.79) |
| *FOREIGN* | + | -0.10257 * | -0.01258 |
| | | (-1.66) | (-0.18) |
| *LOSS* | + | 0.19831 *** | 0.14116 *** |
| | | (5.12) | (4.12) |
| Wald-test | | 3.98 | 8.61 |
| (p-value) | | (0.05) | (0.00) |
| **Firm Years** | | 2,698 | 4,222 |
| **Adj. $R^2$** | | 0.8643 | 0.7403 |

**Notes:**
Table 8 shows the results of esimating subsample analysis. Thereby, column (1) presents the results considering observations when the firm investment is located in common-law countries, whereas column (2) shows the corresponding results for observations when the firm investment is located in civil-law countries. The dependent variable in column (1) and, respectively, column (2) is the natural log of audit fees (LNFEE). Coefficients and t-statistics (in parentheses) are based on ordinary least square regressions that include fixed effects for fiscal year, industry and country. The analyses employ heteroskedasticity-adjusted robust standard errors clustered by firm. The regression is estimated with an intercept included (not tabulated). ***, **, and * denote p-value significance at the 1%, 5%, and 10% levels, with two-tailed tests. All variables are defined in the Appendix.

**Table 9** Sensitivity analyses on the association between foreign ownership and audit fees using lagged ownership variables

| Variables | Expected sign | (1) | (2) | (3) |
|---|---|---|---|---|
| *FOSH_LAG* | + | 0.05239 * | | |
| | | (1.83) | | |
| *FOSH_COMMON_LAG* | + | | 0.12003 *** | 0.17391 ** |
| | | | (3.21) | (2.54) |
| *FOSH_CIVIL_LAG* | + | | 0.00682 | 0.00591 |
| | | | (0.19) | (0.17) |
| *COMMON*[#] | + | | | 0.63027 *** |
| | | | | (3.61) |
| *FOSH_COMMON_LAG*COMMON*[#] | +/- | | | -0.07796 |
| | | | | (-0.98) |
| *LNTA* | + | 0.39809 *** | 0.39649 *** | 0.39735 *** |
| | | (19.39) | (19.32) | (19.36) |
| *LNSEG* | + | 0.20068 *** | 0.20066 *** | 0.20104 *** |
| | | (5.18) | (5.18) | (5.19) |
| *LNINVREC* | + | 0.16155 *** | 0.16148 *** | 0.16107 *** |
| | | (8.00) | (7.98) | (7.96) |
| *LEVERAGE* | + | 0.36920 *** | 0.36948 *** | 0.36747 *** |
| | | (4.15) | (4.16) | (4.13) |
| *GROWTH* | +/- | -0.03216 ** | -0.03081 ** | -0.03083 ** |
| | | (-2.41) | (-2.32) | (-2.32) |
| *ROE* | - | -0.06146 ** | -0.06033 ** | -0.05970 ** |
| | | (-2.47) | (-2.41) | (-2.38) |
| *BTM* | +/- | -0.05661 *** | -0.05589 *** | -0.05579 *** |
| | | (-4.68) | (-4.61) | (-4.60) |
| *NAS* | +/- | -0.47222 *** | -0.46830 *** | -0.46952 *** |
| | | (-7.48) | (-7.44) | (-7.46) |
| *BIG4* | + | 0.11443 | 0.11478 *** | 0.11467 *** |
| | | (3.07) *** | (3.08) | (3.09) |
| *BUSY* | + | 0.10006 | 0.09710 ** | 0.09809 ** |
| | | (2.57) ** | (2.49) | (2.51) |
| *FOREIGN* | + | -0.04346 | -0.04149 | -0.04024 |
| | | (-0.85) | (-0.81) | (-0.79) |
| *LOSS* | + | 0.13343 *** | 0.13417 *** | 0.13451 *** |
| | | (4.58) | (4.59) | (4.60) |
| Wald-test | | | 10.32 | |
| (p-value) | | | (0.00) | |
| **Firm Years** | | 5,187 | 5,187 | 5,187 |
| **Adj. $R^2$** | | 0.7968 | 0.7972 | 0.7973 |

**Notes:**
Column (1), (2), and, respectively, (3) of Table 9 presents the reuslts of esimtaing Eq. (1), (2), and, respectively, (3) using lagged ownership variables. The dependent variable in column (1), (2), and, respectively, (3) is the natural log of audit fees (LNFEE). Coefficients and t-statistics (in parentheses) are based on ordinary least square regressions that include fixed effects for fiscal year, industry and country. The analyses employ heteroskedasticity-adjusted robust standard errors clustered by firm. The regression is estimated with an intercept included (not tabulated). ***, **, and * denote p-value significance at the 1%, 5%, and 10% levels, with two-tailed tests. All variables are defined in the Appendix.

**Table 10** Sensitivity analyses on the association between foreign ownership and audit fees using size-adujusted audit fees as the dependent variable

| Variables | Expected sign | (1) | (2) | (3) |
|---|---|---|---|---|
| *FOSH* | + | 0.02619 * | | |
| | | (1.76) | | |
| *FOSH_COMMON* | + | | 0.05325 ** | 0.06579 * |
| | | | (2.37) | (1.71) |
| *FOSH_CIVIL* | + | | -0.00121 | -0.00141 |
| | | | (-0.07) | (-0.08) |
| *COMMON*[#] | + | | | 0.25695 *** |
| | | | | (3.25) |
| *FOSH_COMMON*COMMON*[#] | +/- | | | -0.01871 |
| | | | | (-0.41) |
| *LNSEG* | + | 0.08805 *** | 0.08867 *** | 0.08871 *** |
| | | (4.74) | (4.77) | (4.77) |
| *LNINVREC* | + | 0.05877 *** | 0.05819 *** | 0.05828 *** |
| | | (9.17) | (9.13) | (9.16) |
| *LEVERAGE* | + | 0.16768 *** | 0.17485 *** | 0.17434 *** |
| | | (3.91) | (4.06) | (4.05) |
| *GROWTH* | +/- | -0.01401 *** | -0.01371 *** | -0.01370 *** |
| | | (-2.84) | (-2.77) | (-2.77) |
| *ROE* | - | -0.04407 *** | -0.04494 *** | -0.04489 *** |
| | | (-3.43) | (-3.50) | (-3.49) |
| *BTM* | +/- | -0.03209 *** | -0.03089 *** | -0.03089 *** |
| | | (-5.94) | (-5.74) | (-5.74) |
| *NAS* | +/- | -0.27233 *** | -0.27506 *** | -0.27552 *** |
| | | (-9.84) | (-9.95) | (-9.93) |
| *BIG4* | + | 0.02809 * | 0.02399 | 0.02397 |
| | | (1.81) | (1.58) | (1.58) |
| *BUSY* | + | 0.04926 ** | 0.05005 ** | 0.05027 ** |
| | | (2.31) | (2.33) | (2.34) |
| *FOREIGN* | + | -0.05863 ** | -0.05474 ** | -0.05441 ** |
| | | (-2.22) | (-2.09) | (-2.07) |
| *LOSS* | + | 0.07491 *** | 0.07385 *** | 0.07395 *** |
| | | (5.60) | (5.55) | (5.57) |
| Wald-test | | | 5.62 | |
| (p-value) | | | (0.02) | |
| **Firm Years** | | 6,920 | 6,920 | 6,920 |
| **Adj. $R^2$** | | 0.2472 | 0.2522 | 0.2518 |

**Notes:**
Column (1), (2), and, respectively, (3) of Table 10 presents the reuslts of esimtaing Eq. (1), (2), and, respectively, (3) using size-adjusted audit fees as the dependent variable. Size-adjusted audit fees are calculated by deflating audit fees by the square root of the clients' total assets. Coefficients and t-statistics (in parentheses) are based on ordinary least square regressions that include fixed effects for fiscal year, industry and country. The analyses employ heteroskedasticity-adjusted robust standard errors clustered by firm. The regression is estimated with an intercept included (not tabulated). ***, **, and * denote p-value significance at the 1%, 5%, and 10% levels, with two-tailed tests. All variables are defined in the Appendix.

**Table 11** Sensitivity analyses on the association between foreign ownership and audit fees using the percentage of ownership

| Variables | Expected sign | (1) | (2) | (3) |
|---|---|---|---|---|
| *FOSH%* | + | 0.00101<br>(1.42) | | |
| *FOSH_COMMON%* | + | | 0.00293 **<br>(2.37) | 0.00311 **<br>(2.11) |
| *FOSH_CIVIL%* | + | | 0.00054<br>(0.69) | 0.00054<br>(0.69) |
| *COMMON*[#] | + | | | 0.73544 ***<br>(4.54) |
| *FOSH_COMMON%*COMMON*[#] | +/- | | | -0.00047<br>(-0.18) |
| *LNTA* | + | 0.40671 ***<br>(22.17) | 0.40573 ***<br>(22.11) | 0.40594 ***<br>(22.13) |
| *LNSEG* | + | 0.19477 ***<br>(5.61) | 0.19600 ***<br>(5.64) | 0.19603 ***<br>(5.64) |
| *LNINVREC* | + | 0.15572 ***<br>(8.58) | 0.15624 ***<br>(8.60) | 0.15614 ***<br>(8.61) |
| *LEVERAGE* | + | 0.33793 ***<br>(4.17) | 0.33674 ***<br>(4.15) | 0.33616 ***<br>(4.14) |
| *GROWTH* | +/- | -0.03475 ***<br>(-3.27) | -0.03426 ***<br>(-3.24) | -0.03427 ***<br>(-3.24) |
| *ROE* | - | -0.07436 ***<br>(-3.36) | -0.07419 ***<br>(-3.35) | -0.07422 ***<br>(-3.36) |
| *BTM* | +/- | -0.06146 ***<br>(-5.42) | -0.06140 ***<br>(-5.40) | -0.06138 ***<br>(-5.40) |
| *NAS* | +/- | -0.49716 ***<br>(-9.03) | -0.49650 ***<br>(-9.02) | -0.49699 ***<br>(-9.02) |
| *BIG4* | + | 0.11531 ***<br>(3.60) | 0.11584 ***<br>(3.62) | 0.11566 ***<br>(3.61) |
| *BUSY* | + | 0.10054 ***<br>(2.82) | 0.10029 ***<br>(2.82) | 0.10046 ***<br>(2.82) |
| *FOREIGN* | + | -0.02951<br>(-0.64) | -0.03064<br>(-0.66) | -0.03036<br>(-0.66) |
| *LOSS* | + | 0.15992 ***<br>(6.20) | 0.15951 ***<br>(6.20) | 0.15954 ***<br>(6.20) |
| Wald-test<br>(p-value) | | | 5.61<br>(0.02) | |
| **Firm Years** | | 6,920 | 6,920 | 6,920 |
| **Adj. $R^2$** | | 0.7963 | 0.7965 | 0.7965 |

**Notes:**
Column (1), (2), and, respectively, (3) of Table 11 presents the reuslts of esimtaing Eq. (1), (2), and, respectively, (3) using the percentage of ownership. The dependent variable in column (1), (2), and, respectively, (3) is the natural log of audit fees (LNFEE). Coefficients and t-statistics (in parentheses) are based on ordinary least square regressions that include fixed effects for fiscal year, industry and country. The analyses employ heteroskedasticity-adjusted robust standard errors clustered by firm. The regression is estimated with an intercept included (not tabulated). ***, **, and * denote p-value significance at the 1%, 5%, and 10% levels, with two-tailed tests. All variables are defined in the Appendix.

# Teil 4: Eigenkapitalbeteiligungen des Managements und die Performance börsennotierter Unternehmen: Eine empirische Analyse für den deutschen Aktienmarkt

**SUMMARY**

Die Trennung von Eigentum und Kontrolle als wesentliches Merkmal börsennotierter Unternehmen in Deutschland führt nicht selten zu dem in der Wirtschaftswissenschaft bekannten Prinzipal-Agenten-Problem. Aus theoretischer Sicht ist die aktive Beteiligung des Managements am Eigenkapital des Unternehmens ein geeignetes Instrument zur Lösung dieses Problems. Der vorliegende Beitrag kann diese Beziehung bestätigen, indem ein positiver empirischer Zusammenhang zwischen Eigenkapitalbeteiligungen des Managements und der Unternehmensperformance nachgewiesen wird.

## Inhaltsübersicht

# 1 Einleitung

Die Trennung von Eigentum und Kontrolle ist ein wesentliches Merkmal börsennotierter Unternehmen in Deutschland. Die Übertragung der Verantwortung für die Leitung des Unternehmens durch den Eigentümer auf den angestellten Manager führt dabei nicht selten zu dem in der Wirtschaftswissenschaft bekannten Prinzipal-Agenten-Problem.[1] Demzufolge hat der opportunistisch handelnde Manager (Agent) nur ein eingeschränktes Interesse die Ziele des Eigentümers (Prinzipal) – im Wesentlichen die Maximierung des Shareholder Value – zu verfolgen. Zur Lösung dieses Interessenkonfliktes werden neben der Überwachung des Managements (Monitoring) gewöhnlich Anreizverträge (Incentives) geschlossen, die die Entlohnung des Agenten von seiner gemessenen Leistung abhängig machen. Die Ausgestaltung solcher Anreizverträge ist insbesondere vor den Hintergrund der Finanzmarktkrise im Jahr 2008 Bestandteil einer breiten wissenschaftlichen und öffentlichen Diskussion.[2] Die mangelnde Fähigkeit bestehender Vergütungssysteme das Handeln des Managements mit den Interessen der Aktionäre zu verknüpfen, ist dabei ein häufig aufgeführter Kritikpunkt.[3]

Nach Jensen und Meckling (1976) ist die aktive Beteiligung des Managements am Eigenkapital des Unternehmens ein geeignetes Mittel zur Interessenharmonisierung von Manager und Aktionär (Interessenkonvergenzhypothese).[4] Obwohl die aktive Betei-

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1 Vgl. Jensen/Meckling, Journal of Financial Economics 3(4)/1976, Theory of the firm: Managerial behavior, agency costs and ownership structure S. 305 (360).

2 Vgl. Arnold/Gillenkirch, Zeitschrift für Betriebswirtschaft 77(1)/2007, Leistungsanreize durch Aktien oder Optionen? Eine Diskussion des State of the Art S. 75 (99); Gillenkirch, Betriebswirtschaftliche Forschung und Praxis Heft 1/2008, Entwicklungslinien in der Managementvergütung S. 1 (17); Lingemann, Betriebs-Berater Heft 36/2009, Angemessenheit der Vorstandsvergütung – Das VorstAG ist in Kraft S. 1918 (1924); Dauner-Lieb/Von Preen/Simon, DB Heft 07/2010, Das VorstAG – Ein Schritt auf dem Weg zum Board-System? S. 377 (383); Leibfried, Audit Committee News Heft 31/2010, Managementvergütung: Fünf Fragen zu einer scheinbar endlosen Debatte S. 4 (7).

3 Vgl. Dauner-Lieb/Von Preen/Simon, DB Heft 07/2010, Das VorstAG – Ein Schritt auf dem Weg zum Board-System? S. 377 (383); Schömig, CFB Heft 07/2013, Corporate Governance, Wertschöpfung und Managementvergütung S. 428 (433).

4 Gemäß der Interessenkonvergenzhypothese fallen durch die aktive Beteiligung des Managements am Eigenkapital des Unternehmens Eigentum und Verfügungsgewalt zusammen. Da das Management nun direkt an einer Steigerung des Shareholder Value partizipiert, kommt es zu einer Angleichung der Interessen von Manager und Aktionär. Dies führt letztlich zu einer Verringerung der Prinzipal-

ligung des Managements am Eigenkapital des Unternehmens bisher vorwiegend im angloamerikanischen Raum umgesetzt wird, ist seit jüngerer Zeit auch in Deutschland ein entsprechender Trend erkennbar.[5] Ursache für diesen Trend ist unter anderem das am 05.08.2009 durch die Bundesregierung verabschiedete Gesetz zur Angemessenheit der Vorstandsvergütung (VorstAG)[6] und die darin enthaltene Forderung nach einer auf eine nachhaltige Unternehmensentwicklung ausgerichteten Vergütungsstruktur (§ 87 Abs. 1 Satz 2 AktG).[7]

Ob eine Eigenkapitalbeteiligung des Managements zu einer Verbesserung der Unternehmensperformance führt und somit die gewünschte Interessenharmonisierung

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Agenten-Probleme. Vgl. zu der Interessenkonvergenzhypothese Jensen/Meckling, Journal of Financial Economics 3(4)/1976, Theory of the firm: Managerial behavior, agency costs and ownership structure S. 305 (360). Im Gegensatz dazu geht die Ausbeutungshypothese von divergierenden Interessen zwischen Manager und Aktionär aus, welche zu einer Vergrößerung der Prinzipal-Agenten-Probleme führt. Mit steigendem Aktienanteil wächst die Machtposition des Managers innerhalb des Unternehmens. Entsprechend der Ausbeutungshypothese ist sich der Manager dieser Machtposition bewusst. Da der Manager sich selbst keiner Kontrolle seiner Handlungen ausgesetzt sieht, wird er mit Nebeninteressen primär eigene Ziele verfolgen, die zu Lasten des Shareholder Value gehen. Vgl. zur Ausbeutungshypothese Morck/Shleifer/Vishny, Journal of Financial Economics, 20(1/2)/1988, Management Ownership and Market Valuation: An Empirical Analysis S. 293 (315). Es sei an dieser Stelle erwähnt, dass die Ausbeutungshypothese erst bei verhältnismäßig hohen Eigenkapitalbeteiligungen zu rechtfertigen ist. Entsprechende Beteiligungen des Managements am Eigenkapital des Unternehmens sind in Deutschland nur selten vorzufinden. Vgl. Boehmer, Journal of Financial Intermediation 9(2)/1976, Business Groups, Bank Control, and Large Shareholders: An Analysis of German Takeovers S. 117 (148).

5 Vgl. Götz/Friese CFB Heft 06/2010, Empirische Analyse der Vorstandsvergütung im DAX und MDAX nach Einführung des Vorstandsvergütungsangemessenheitsgesetzes S. 410 (420); Götz/Friese, CFB Heft 08/2011, Vorstandsvergütung im DAX und MDAX – Weiterführung der empirischen Analyse 2010 nach Einführung des Vorstandsvergütungsangemessenheitsgesetzes S. 498 (508); Götz/Friese, CFB Heft 08/2012, Vorstandsvergütung im DAX und MDAX – Fortsetzung der empirischen Analyse 2011 nach Einführung des Vorstandsvergütungsangemessenheitsgesetzes S. 414 (424); Götz/Friese, CFB Heft 06/2013, Vorstandsvergütungen im DAX und MDAX 2012 – Fortsetzung der empirischen Analyse nach Einführung des Vorstandsvergütungsangemessenheitsgesetzes S. 374 (383).

6 Vgl. BGBl Jahrgang 2009 Teil I Nr. 50 S. 2509 (2511).

7 Um den Regelungen dieses Gesetzes zu begegnen, haben Unternehmen verstärkt Richtlinien für Eigeninvestments eingeführt. Diese schreiben den Vorständen vor, Teile ihre Bezüge in Aktien des Unternehmens zu investieren, um eine wirkungsvolle Interessenharmonisierung zwischen dem Management und den Aktionären herbeizuführen. Vgl. Götz/Friese CFB Heft 06/2010, Empirische Analyse der Vorstandsvergütung im DAX und MDAX nach Einführung des Vorstandsvergütungsangemessenheitsgesetzes S. 410 (420); Götz/Friese, CFB Heft 08/2011, Vorstandsvergütung im DAX und MDAX – Weiterführung der empirischen Analyse 2010 nach Einführung des Vorstandsvergütungsangemessenheitsgesetzes S. 498 (508); Götz/Friese, CFB Heft 08/2012, Vorstandsvergütung im DAX und MDAX – Fortsetzung der empirischen Analyse 2011 nach Einführung des Vorstandsvergütungsangemessenheitsgesetzes S. 414 (424); Götz/Friese, CFB Heft 06/2013, Vorstandsvergütungen im DAX und MDAX 2012 – Fortsetzung der empirischen Analyse nach Einführung des Vorstandsvergütungsangemessenheitsgesetzes S. 374 (383).

zwischen Manager und Aktionär mit sich bringt ist letztlich eine empirische Fragestellung. Die bisherige, vornehmlich internationale Literatur zeigt grundsätzlich einen positiven Einfluss von am Eigenkapital beteiligten Managern auf die Performance ihrer Unternehmen (siehe hierzu Ausführungen in Abschnitt 2). In Deutschland ist diesem Forschungsschwerpunkt bisher kaum Aufmerksamkeit geschenkt worden.[8] Vor diesem Hintergrund untersucht dieser Beitrag die Konsequenzen von Eigenkapitalbeteiligungen des Managements auf die Performance des Unternehmens für den deutschen Aktienmarkt. Dadurch wird nicht nur die Forschungslücke für den deutschsprachigen Raum geschlossen, sondern auch wichtige Erkenntnisse zu einer gesellschaftlich relevanten Fragestellung beigetragen.[9]

Ausgehend von einer Stichprobe von 210 börsennotierten Unternehmen über einen Zeitraum von 6 Jahren (2005 bis 2010) zeigen die Ergebnisse dieses Beitrags einen positiven Einfluss von Eigenkapitalbeteiligungen des Managements auf die Unternehmensperformance. Anders als die Untersuchung von Kaserer und Moldenhauer (2008) erfasst die vorliegende Studie die seit 2005 verpflichtende Anwendung der IFRS, die Folgen der Finanzmarktkrise aus dem Jahr 2008 sowie den seit dem Jahr 2009 durch den Erlass des VorstAG[10] zunehmenden Trend das Management zu einer Investition in

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8 Eine empirische Untersuchung des Einflusses von Eigenkapitalbeteiligungen des Managements auf die Unternehmensperformance für die Jahre 1998 und 2003 in Deutschland liefert Kaserer/Moldenhauer, Review of Managerial Science 2(1)/2008, Insider ownership and corporate performance: evidence from Germany S. 1 (35).

9 Zur öffentlichen Diskussion hinsichtlich einer adäquaten Gestaltung der Managementvergütung zur Herbeiführung einer Interessenharmonisierung zwischen Manager und Aktionär, vgl. stellvertretend für viele, Manager Magazin Online (2009): Gedeckelte Manager, abrufbar unter http://www.manager-magazin.de/magazin/artikel/a-627530.html, abgerufen am 11.08.2015; Handelsblatt Online (2009): „Wer verdient sein Geld, wer bekommt es nur?“, abrufbar unter http://www.handelsblatt.com/karriere/nachrichten/studie-zu-managergehaeltern-wer-verdient-sein-geld-wer-bekommt-es-nur/3023996.html, abgerufen am 11.08.2015; Spiegel Online (2009): Finanzexperten plädieren für strengere Bonus-Regeln, abrufbar unter http://www.spiegel.de/wirtschaft/soziales/umfrage-finanzexperten-plaedieren-fuer-strengere-bonus-regeln-a-650826.html, abgerufen am 11.08.2015; Handelsblatt Online (2014): So entsteht das Millionengehalt eines Topmanagers, abrufbar unter http://www.handelsblatt.com/unternehmen/management/gerechter-lohn-so-entsteht-das-millionengehalt-eines-topmanagers/10338328.html, abgerufen am 11.08.2015.

10 Vgl. BGBl Jahrgang 2009 Teil I Nr. 50 S. 2509 (2511).

eigene Aktien zu verpflichten. Es wäre wünschenswert, wenn sich dieser Trend fortsetzt, legen die Ergebnisse dieses Beitrags doch nahe, dass die Eigenkapitalbeteiligung des Managements ein wirkungsvolles Instrument zu sein scheint die gewünschte Interessenharmonisierung zwischen Manager und Aktionär herbeizuführen.

Der Beitrag gliedert sich wie folgt: In Abschnitt 2 werden die Ergebnisse bisheriger Untersuchungen zu Eigenkapitalbeteiligungen des Managements dargestellt. Im Anschluss daran erfolgt eine Beschreibung der verwendeten Stichprobe (Abschnitt 3). Abschnitt 4 diskutiert die deskriptive Statistik und liefert die Ergebnisse der univariaten Untersuchung. Die Ergebnisse der multivariaten Untersuchung werden in Abschnitt 5 präsentiert. Der Beitrag schließt mit einer Zusammenfassung in Abschnitt 6.

## 2 Bisherige Untersuchungen zu Eigenkapitalbeteiligungen des Managements

Die bisherige Forschung zu Eigenkapitalbeteiligungen des Managements und deren Einfluss auf die Unternehmensperformance beschränkt sich überwiegend auf den angloamerikanischen Raum. Der Großteil der Studien findet einen positiven Einfluss von am Eigenkapital beteiligten Managern auf die Performance ihrer Unternehmen, weist aber gleichwohl nach, dass dieser Zusammenhang nicht linear ist.[11] So finden Morck et al. (1988) einen positiven Einfluss auf die Unternehmensperformance bis zu einer Beteiligungshöhe von 5 %. Überschreitet die Eigenkapitabeteiligung hingegen diesen kritischen Schwellenwert kehrt sich der Effekt um und ein negativer Einfluss ist beobachtbar. Schließlich wird ab einer Beteiligungshöhe von 25 % erneut ein positiver

[11] Einen positiven linearen Zusammenhang finden Mehran, Journal of Financial Economics 38(2)/1995, Executive compensation structure, ownership, and firm performance S. 163(184); Core/Larcker, Journal of Financial Economics 64(3)/2002, Performance consequences of mandatory increases in executive stock ownership S. 317 (340).

Einfluss auf die Unternehmensperformance nachgewiesen.[12] Einen vergleichbaren Funktionsverlauf finden Short und Keasey (1999), wenngleich die entsprechenden Wendepunkte bei unterschiedlichen Beteiligungshöhen festgestellt werden. Demnach ist ein positiver Einfluss bei einer Beteiligungshöhe zwischen 0 % und 12,99 % erkennbar. Diesen Schwellenwert übersteigende Eigenkapitalbeteiligungen wirken sich zunächst negativ auf die Unternehmensperformance aus wohingegen ab einer Beteiligungshöhe von über 49 % erneut ein positiver Einfluss gezeigt wird.[13] Zu einem anderen Funktionsverlauf, aber dennoch ähnlichen Ergebnis kommen McConnell und Servaes (1990). Entsprechend ihrer Studie bewirken am Eigenkapital des Unternehmens beteiligte Manager einen positiven Einfluss auf die Unternehmensperformance. Indes zeigt sich, dass sich der Effekt mit steigender Beteiligungshöhe umkehrt. Hier ist ein Wendepunkt der Wirkungsrichtung auf die Unternehmensperformance bei einer Beteiligungshöhe zwischen 40 % und 50 % feststellbar.[14]

Die Ergebnisse der aufgeführten Studien zeigen einen nicht-linearen Zusammenhang zwischen der Höhe der Eigenkapitalbeteiligung des Managements und der Unternehmensperformance. Eine gemeingültige Antwort auf die Frage, ob Eigenkapi-

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12 Vgl. Morck/Shleifer/Vishny, Journal of Financial Economics 20(1)/1988, Management ownership and market valuation: An empirical analysis S. 293 (315).

13 Vgl. Short/Keasey, Journal of Corporate Finance 5(1)/1999, Managerial ownership and the performance of firms: evidence from the UK S. 79 (101).

14 Vgl. McConnell/Servaes, Journal of Financial Economics 27(2)/1990, Additional evidence on equity ownership and corporate value S. 595 (612). Für weitere Studien, die einen positiven nichtlinearen Zusammenhang zwischen Eigenkapitalbeteiligungen des Managements und der Unternehmensperformance zeigen, vgl. Hermalin/Weisbach, Financial Management 20(4)/1991, The Effect of Board Composition and Direct Incentives on Firm Performance S. 101 (112); Hubbard/Palia, The Rand Journal of Economics 26(4)/1995, Benefits of control, managerial ownership, and the stock returns of acquiring firms S. 782 (792); Holderness/Kroszner/Sheehan, Journal of Finance 54(2)/1999, "Were the good old days that good? Changes in managerial stock ownership since the Great Depression" S. 435 (469); Davies/Hiller/McColgan, Journal of Corporate Finance 11(4)/2005, Ownership structure, managerial behavior and corporate value S. 645 (660); Adams/Santos, Journal of Accounting and Economics 41(1/2)/2006, Identifying the effect of managerial control on firm performance S. 55 (85); Pukthuanthong/Roll/Walker, Journal of Corporate Finance 13(5)/2007, How employee stock options and executive equity ownership affect long-term IPO operating performance S. 695 (720); McConnell/Servaes/Lins, Journal of Corporate Finance 14(2)/2008, Changes in insider ownership and changes in the market value of the firm S. 92 (106); Tong, Journal of Banking & Finance 32(11)/2008, Deviations from optimal CEO ownership and firm value S. 2462 (2470); Benson/Davidson, Journal of Corporate Finance 15(5)/2009, Reexamining the managerial ownership effect on firm value S. 573 (586).

talbeteiligungen des Managements grundsätzlich positiv oder negativ zu beurteilen sind, ist daher nicht ohne weiteres möglich. Vielmehr hängt die Beantwortung der Frage von der Beteiligungshöhe ab. Insofern scheint aus empirischer Sicht sowohl die Interessenkonvergenz- als auch die Ausbeutungshypothese Gültigkeit zu besitzen.[15]

In Deutschland ist diesem Forschungsschwerpunkt – wie oben beschrieben – bisher kaum Aufmerksamkeit geschenkt worden. Hohe Eigenkapitalbeteiligungen des Managements sind im Gegensatz zu dem angloamerikanischen Raum nicht weit verbreitet. Insbesondere die Gültigkeit der Ausbeutungshypothese ist in Deutschland daher nicht anzunehmen. Lediglich Kaserer und Moldenhauer (2008) untersuchen den Einfluss von Eigenkapitalbeteiligungen des Managements auf die Unternehmensperformance in Deutschland. Für die Jahre 1998 und 2003 zeigen die Ergebnisse ihrer Studie einen positiven Einfluss von Eigenkapitalbeteiligungen des Managements auf die Performance der Unternehmen. Anders als die Studien von Morck et al. (1988)[16], Short und Keasey (1999)[17] und McConnell und Servaes (1990)[18] finden die Autoren einen linearen Funktionsverlauf und somit Bestätigung für die Interessenkonvergenzhypothese.[19] Die Gültigkeit der Ausbeutungshypothese hingegen kann auch nach Durchführung diverser Sensitivitätsanalysen nicht nachgewiesen werden.[20]

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15 Zur Erläuterung der Interessenkonvergenz- und Ausbeutungshypothese sei auf Fn. 4 in Abschnitt 1 verwiesen.

16 Vgl. Morck/Shleifer/Vishny, Journal of Financial Economics 20(1)/1988, Management ownership and market valuation: An empirical analysis S. 293 (315).

17 Vgl. Short/Keasey, Journal of Corporate Finance 5(1)/1999, Managerial ownership and the performance of firms: evidence from the UK S. 79 (101).

18 Vgl. McConnell/Servaes, Journal of Financial Economics 27(2)/1990, Additional evidence on equity ownership and corporate value S. 595 (612).

19 Vgl. Kaserer/Moldenahauer, Review of Managerial Science 2(1)/2008, Insider ownership and corporate performance: evidence from Germany S 1 (35).

20 Als Test auf Endogenität wählen die Autoren u.a. die Methode der zweistufigen kleinsten Quadrate, vgl. Kaserer/Moldenahauer, Review of Managerial Science 2(1)/2008, Insider ownership and corporate performance: evidence from Germany S 1 (35). Hierbei wird die Korrelation zwischen der abhängigen und der unabhängigen Variable zunächst in eine „erwünschte Streuung", die zur Korrelation mit dem systematischen Teil der abhängigen Variable führt, und eine „unerwünschte Streuung", die zu Korrelation mit dem nicht-systematischen Teil der abhängigen Variable, den Störterm, führt, zerteil (1. Stufe), um anschließend die abhängige Variable auf den systematischen Teil der abhängi-

## 3 Beschreibung der Stichprobe

Die Stichprobe für die vorliegende empirische Untersuchung umfasst 210 börsennotierte Unternehmen und 869 Unternehmensjahre über einen Zeitraum von 6 Jahren (2005-2010). Finanzdaten wurden der *Thomson Reuters Worldscope Datenbank* entnommen. Auf dessen Grundlage erfolgt u.a. die Beurteilung der Unternehmensperformance anhand der Kennzahlen Gesamtkapitalrentabilität (RoA) und Eigenkapitalrentabilität (RoE).[21] Angaben zu der Höhe der von Managern gehaltenen Anteile am Eigenkapital des Unternehmens wurden der *Bureau van Dijk (BvD) Amadeus-Datenbank* entnommen.[22] Da die Amadeus-Datenbank erst seit dem Jahr 2002 kontinuierlich gepflegt wird, steigt die Zahl der beobachteten Unternehmen in den einzelnen Jahren. Eine Übersicht der Verteilung der Beobachtungen für die einzelnen Jahre zwischen 2005 und 2010 ist in Tabelle 1 enthalten.

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gen Variable zu regressieren (2. Stufe). Zur Veranschaulichung der Methode der zweistufigen kleinsten Quadrate, vgl. z.B. von Auer, Ökonometrie, 5. Aufl. 2011. Zum Endogenitätsproblem im Allgemeinen, vgl. http://download.springer.com/static/pdf/442/chp%253A10.1007%252F978-3-322-96406-9_17.pdf?auth66=1397645668_77a68efa83eea7dedf353ae94e2da7ad&ext=.pdf, abgerufen am 14.04.2014.

[21] Der RoA (Return on Assets oder Gesamtkapitalrentabilität) ergibt sich aus Jahresüberschuss/Bilanzsumme und der RoE (Return on Equity oder Eigenkapitalrentabilität) aus Jahresüberschuss/Eigenkapital.

[22] Die Bureau van Dijk (BvD) Amadeus Datenbank enthält u.a. detaillierte Informationen über die Eigentümerstruktur europäischer Unternehmen aus insgesamt 34 Ländern. Zur Informationsbeschaffung bedient sich die Amadeus Datenbank einer Vielzahl von Quellen. Neben den Geschäftsberichten der Unternehmen bezieht die Amadeus-Datenbank ihre Informationen im Wesentlichen von amtlichen Registern und Regulierungsbehörden, den Unternehmenswebseiten, den Pressenachrichten und externen Wirtschaftsauskunftsdateien (für Deutschland: Verband der Vereine Creditreform). Insbesondere aufgrund dieses umfangreichen Informationsbeschaffungsprozesses kann auf eine hohe Verlässlichkeit der Daten geschlossen werden. Die Amadeus-Datenbank stellt somit eine ideale Datenbasis für die empirische Untersuchung des vorliegenden Beitrags dar.

| Jahr | Anzahl der Beobachtungen |
|---|---|
| *2005* | 109 |
| *2006* | 128 |
| *2007* | 155 |
| *2008* | 149 |
| *2009* | 157 |
| *2010* | 171 |
| 2005 - 2010 | 869 |

Tab. 1: Verteilung der Beobachtungen für die Jahre 2005 bis 2010

## 4 Deskriptive Statistik und univariate Ergebnisse

Tabelle 2 präsentiert die deskriptive Statistik der Untersuchungsstichprobe. Danach weisen Unternehmen eine Gesamtkapitalrentabilität (Eigenkapitalrentabilität) von durchschnittlich 2,63 % (9,55 %) auf. Der durchschnittliche Anteil der von Managern gehaltenen Eigenkapitalbeteiligungen (Managerbet.) beläuft sich auf 0,27 %. Der Wert von ln(Bilanzsumme) beträgt 12,83 und entspricht einer durchschnittlichen Bilanzsumme in Höhe von 3.418 Mio. €. Des Weiteren zeigt Tabelle 2 eine durchschnittliche Fremdkapitalquote[23] in Höhe von 49,14 %, eine durchschnittliche Anlagenintensität[24] in Höhe 15,89 % und ein durchschnittliches Unternehmenswachstum[25] in Höhe von 8,68 %. Die relativ geringe Anlagenintensität (15,89 %) lässt den Schluss zu, dass materielle Vermögenswerte von nachgeordneter Bedeutung innerhalb der Vermögensstruktur der Untersuchungsstichprobe zu sein scheinen. Das logarithmierte Unternehmensalter (ln(Unternehmensalter)) beläuft sich schließlich auf 3,46 und entspricht einem Durch-

[23] Die Fremdkapitalquote ergibt sich aus: Fremdkapital/Bilanzsumme.
[24] Die Anlagenintensität ergibt sich aus: Anlagevermögen/Bilanzsumme.
[25] Das Unternehmenswachstum entspricht der Zuwachsrate der Umsätze und ergibt sich aus: (Umsatz des aktuellen Jahres – Umsatz des vorangegangenen Jahres)/Umsatz des vorangegangenen Jahres.

schnitt von 52,2 Jahren. In Bezug auf die Variablen Managerbet., ln(Bilanzsumme) und ln(Unternehmensalter) kann anhand des im Vergleich zum Durchschnitt deutlich kleineren Median auf eine rechtsschiefe Verteilung geschlossen werden.

| Variable | Durchschnitt | Median |
|---|---|---|
| *RoA* | 0.02626 | 0.04121 |
| *RoE* | 0.09546 | 0.10402 |
| *Managerbet.* | 0.00267 | 0.00000 |
| *ln(Bilanzsumme)* | 12.83153 | 12.30015 |
| *Fremdkapitalquote* | 0.49141 | 0.53356 |
| *ln(Unternehmensalter)* | 3.46069 | 3.29584 |
| *Analgenintensität* | 0.15890 | 0.10101 |
| *Unternehmenswachstum* | 0.08683 | 0.06150 |

Tab. 2: Deskriptive Statistik

Abb. 1 stellt die Entwicklung der Beobachtungen innerhalb der Untersuchungsstichprobe mit einer Eigenkapitalbeteiligung des Managements für die einzelnen Jahre zwischen 2005 und 2010 dar. Von 869 Beobachtungen (Grundgesamtheit der Untersuchungsstichprobe) weisen 64 Beobachtungen (rd. 7,5 % der Untersuchungsstichprobe) eine Eigenkapitalbeteiligung des Managements größer 0 % auf.[26] Innerhalb des Untersuchungszeitraums beträgt der durchschnittliche Anteil der von Managern gehaltenen Eigenkapitalbeteiligungen innerhalb dieser 64 Beobachtungen 3,72 % (nicht aus der Abb. 1 ersichtlich). Abb. 1 unterstreicht den bereits von Götz und Friese

[26] Die Untersuchungsstichprobe enthält demnach eine relative geringe Anzahl von Beobachtungen mit einer Eigenkapitalbeteiligung des Managements größer 0 %. Dies könnte im Wesentlichen dadurch begründet sein, dass dem Management börsennotierter Unternehmen in Deutschland vorwiegend aktienbasierte Vergütungen in Form von Aktienoptionsprogrammen gewährt werden anstatt es direkt am Eigenkapital des Unternehmens zu beteiligen. Dies ist auch in Übereinstimmung mit den Ergebnissen von Götz/Friese (2010/2011/2012/2013), die unter Heranziehung der Geschäftsberichte der DAX- und MDAX-Unternehmen zwar eine über die Jahre steigende, aber dennoch geringe Anzahl von Unternehmen identifizieren, die das Management zu einer tatsächlichen Investition in eigene Aktien des Unternehmens verpflichten.

(2010/2011/2012/2013) identifizierten Trend das Management deutscher börsennotierten Unternehmen zunehmend am Eigenkapital des Unternehmens zu beteiligen.[27] Während die Anzahl der Beobachtungen mit einer Eigenkapitalbeteiligung des Managements in den Jahren zwischen 2005 und 2008 relativ konstant ist, zeigt Abb. 1 in den Jahren 2009 und 2010 eine deutliche Aufwärtsbewegung. Ursächlich hierfür könnte das am 05.08.2009 durch die Bundesregierung verabschiedete VorstAG[28] sein bzw. die darin enthaltene Forderung nach einer auf eine nachhaltige Unternehmensentwicklung ausgerichteten Vergütungsstruktur (§ 87 Abs. 1 Satz 2 AktG).

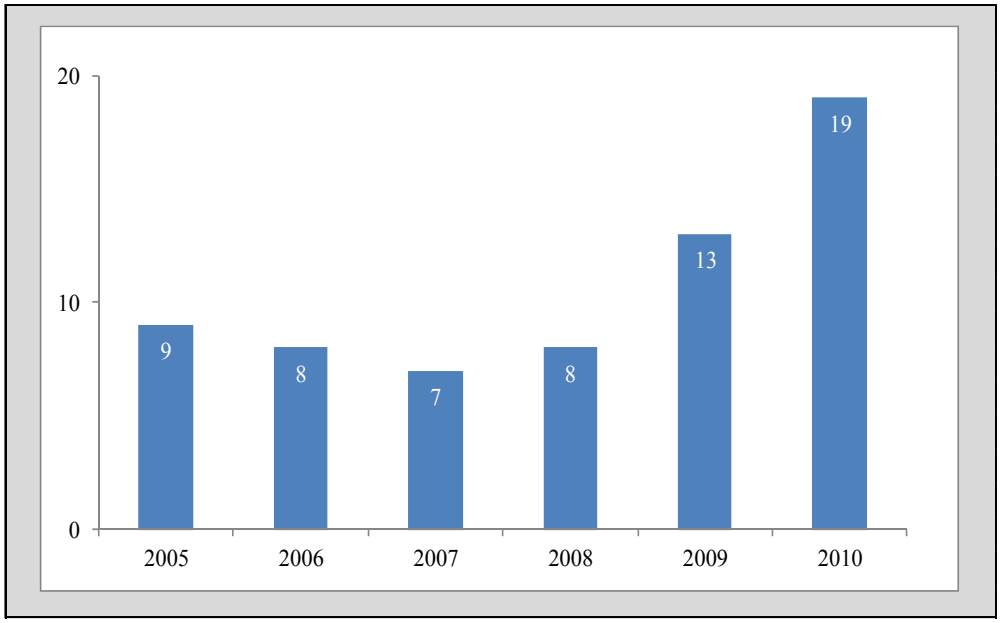


Abb. 1: Anzahl der Beobachtungen mit einer Eigenkapitalbeteiligung des Managements in den Jahren 2005 bis 2010

Mittels einer univariaten Analyse soll im Folgenden zunächst untersucht werden, ob Unternehmen mit einer Eigenkapitalbeteiligung des Managements (Stichprobe 1)

[27] Vgl. Götz/Friese CFB Heft 06/2010, Empirische Analyse der Vorstandsvergütung im DAX und MDAX nach Einführung des Vorstandsvergütungsangemessenheitsgesetzes S. 410 (420); Götz/Friese, CFB Heft 08/2011, Vorstandsvergütung im DAX und MDAX – Weiterführung der empirischen Analyse 2010 nach Einführung des Vorstandsvergütungsangemessenheitsgesetzes S. 498 (508); Götz/Friese, CFB Heft 08/2012, Vorstandsvergütung im DAX und MDAX – Fortsetzung der empirischen Analyse 2011 nach Einführung des Vorstandsvergütungsangemessenheitsgesetzes S. 414 (424); Götz/Friese, CFB Heft 06/2013, Vorstandsvergütungen im DAX und MDAX 2012 – Fortsetzung der empirischen Analyse nach Einführung des Vorstandsvergütungsangemessenheitsgesetzes S. 374 (383).

[28] Vgl. BGBl Jahrgang 2009 Teil I Nr. 50 S. 2509 (2511).

eine höhere Performance aufweisen als Unternehmen ohne ein entsprechendes Merkmal (Stichprobe 2). Tabelle 3 zeigt das arithmetische Mittel der zur Beurteilung der Unternehmensperformance herangezogenen Kennzahlen (RoA und RoE) und die Anzahl der Beobachtungen (n) innerhalb dieser beiden Stichproben sowie das Ergebnis des parametrischen t-Tests.[29]

| Variable | Stichprobe 1 | Stichprobe 2 | t-Wert |
|---|---|---|---|
| ***RoA*** | **2.86%** | **2.61%** | 0.16 |
| *n* | 64 | 805 | |
| ***RoE*** | **20.78%** | **8.67%** | 1.83* |
| *n* | 64 | 805 | |

****, ** und * bezeichnen dabei Signifikanz auf 1%-, 5%- und 10%-Niveau.*

Tab. 3: Ergebnisse der univariaten Untersuchung

Für die Kennzahl RoE ist eine deutlich höhere Performance bei Unternehmen mit einer Eigenkapitalbeteiligung des Managements zu beobachten als bei der Vergleichsgruppe. Das arithmetische Mittel von 20,78 % von Unternehmen mit einer Managementbeteiligung ist nach dem t-Test statistisch signifikant verschieden von 8,67 % bei Unternehmen ohne Managementbeteiligung. Bei der Kennzahl RoA ist nur eine geringfügig höhere Performance bei Unternehmen mit dem Merkmal Managementbeteiligung zu beobachten (2,86 % verglichen mit 2,61 %). Die beobachtete Abweichung ist jedoch statistisch nicht signifikant. Insgesamt geben die Ergebnisse der univariaten Untersuchung noch keinen eindeutigen Hinweis darauf, dass Unternehmen mit einer Managementbeteiligung besser performen. Um genauere Erkenntnisse über den Einfluss von Eigenkapitalbeteiligungen des Managements auf die Unternehmensperformance zu

[29] Der parametrische t-Test testet auf signifikante Unterschiede in den Mittelwerten der beiden Stichproben.

erlangen wird daher im folgenden Abschnitt 5 eine multivariate Untersuchung durchgeführt.

# 5 Multivariate Untersuchung

Zur Berücksichtigung weitere Einflussfaktoren, die einen Erklärungsgehalt auf die Performanceunterschiede zwischen Unternehmen mit einer Eigenkapitalbeteiligung des Managements und Unternehmen ohne ein entsprechendes Merkmal liefern könnten, wird im Folgenden eine multiple lineare Regressionsanalyse (gepoolte OLS-Regression) durchgeführt. Das entsprechende Regressionsmodell stellt sich wie folgt dar:

$$\mathbf{RoA \mid RoE} = \boldsymbol{\beta_0} + \boldsymbol{\beta_1}\,(\mathbf{Managerbet.}) + \sum_{\mathbf{j=2}}^{\mathbf{6}} \boldsymbol{\beta_j}\,(\mathbf{Kontrollvariable}) + \sum_{\mathbf{j=7}}^{\mathbf{11}} \boldsymbol{\beta_j}\,(\mathbf{Jahr-Dummies}) + \sum_{\mathbf{j=12}}^{\mathbf{21}} \boldsymbol{\beta_j}\,(\mathbf{Industrie-Dummies}) + \varepsilon_1 \quad (1)$$

$\beta_0$ = Regressionskonstante

$\beta_j$ = Regressionskoeffizient der j-ten exogenen Variablen

$\varepsilon_1$ = Störterm der Regression

Die Variable Managerbet. stellt die Summe der von Managern in Prozent gehaltenen Eigenkapitalanteile an dem entsprechenden Unternehmen dar. Um für mögliche, weitere die Unternehmensperformance beeinflussende Faktoren zu kontrollieren, werden neben der Untersuchungsvariable zusätzlich die in der deskriptiven Statistik (siehe Abschnitt 4) bereits aufgeführten und in bisherig ähnlich ausgestalteten Untersuchungen für die Unternehmensperformance als aussagekräftig identifizierten Kontrollgrößen einbezogen, um eine Fehlspezifikation des Modells zu vermeiden. Im Einzelnen sind das die logarithmierte Bilanzsumme (ln(Bilanzsumme)), die Fremdkapitalquote, das logarithmierte Unternehmensalter (ln(Unternehmensalter)), die Anlagenintensität und das Unternehmenswachstum. Der Vermeidung potenzieller Heterogenität innerhalb der

verschiedenen Jahre und Industrien wird durch die Jahr- und Industrie-Dummies Rechnung getragen. Zur Berücksichtigung von Heteroskedastizität innerhalb der Datenmessung wird die Regression zusätzlich mit nach Unternehmen gruppierten robusten Standardfehlern gerechnet. Das in Gleichung (1) dargestellte Regressionsmodell wird für die endogenen Variablen RoA und RoE separat geschätzt (siehe Tabelle 4).

| **Variable** | **RoA** | **RoE** |
|---|---|---|
| *Managerbet.* | 0.23807 ** | 1.01824 ** |
| *ln(Bilanzsumme)* | 0.01774 *** | 0.08248 *** |
| *Fremdkapitalquote* | -0.17436 *** | -0.54108 *** |
| *ln(Unternehmensalter)* | 0.00354 | -0.00895 |
| *Anlagenintensität* | 0.14826 *** | 0.32358 ** |
| *Unternehmenswachstum* | 0.03404 | 0.14210 * |
| **Unternehmensjahre** | 869 | 869 |
| **Korrigiertes R-Quadrat** | 0.1726 | 0.2144 |

****, ** und * bezeichnen dabei Signifikanz auf 1%-, 5%- und 10%-Niveau.*

Tab. 4: Ergebnisse der gepoolten OLS-Regression

Insgesamt wurden 869 Unternehmensjahre in die multivariate Untersuchung einbezogen. Das Modell mit RoA (RoE) als endogene Variable weist ein korrigiertes R-Quadrat in Höhe von 17,26 % (21,44 %) auf. Die Erklärungskraft der beiden Modelle entspricht der Erklärungskraft bisheriger, vergleichbarer Studien.[30] In Hinsicht auf die Untersuchungsvariable Managerbet. zeigen die Ergebnisse einen statistisch signifikan-

[30] R-Quadrat (McConnell/Servaes): 13,1 % - 18,4 %, vgl. McConnell/Servaes, Journal of Financial Economics 27(2)/1990, Additional evidence on equity ownership and corporate value S. 595 (612); R-Quadrat (Short/Keasey): 19,8 % - 24 %, vgl. Short/Keasey, Journal of Corporate Fianance 5(1)/1999, Managerial ownership and the performance of firms: evidence from the UK S. 79 (101); R-Quadrat (Kaserer/Moldenhauer): 17,0 % - 18,6 %, vgl. Kaserer/Moldenahauer, Review of Managerial Science 2(1)/2008, Insider ownership and corporate performance: evidence from Germany S 1 (35).

ten und positiven Einfluss von am Eigenkapital des Unternehmens beteiligten Managern auf die Unternehmensperformance. Der statistisch signifikante Einfluss ist unabhängig von der Wahl des Performance-Maßes (RoA und RoE). In Übereinstimmung mit bisherigen Studien zeigt der Großteil der verwendeten Kontrollvariablen ebenfalls einen statistisch signifikanten Einfluss auf die Unternehmensperformance. Demnach gilt, dass je größer das Unternehmen (ln(Bilanzsumme)), desto profitabler ist das Unternehmen. Der statistisch signifikante und negative Einfluss der Fremdkapitalquote auf die Unternehmensperformance macht deutlich, dass Unternehmen mit einem hohen Anteil von Fremdkapital gemessen am Gesamtkapital und dementsprechend höherem Kapitalrisiko eine niedrigere Performance erzielen als Unternehmen mit vergleichsweise geringem Verschuldungsgrad. Das Unternehmensalter (ln(Unternehmensalter)) zeigt unabhängig von dem verwendetet Performance-Maß keinen statistisch signifikanten Einfluss auf die Unternehmensperformance. Die Ergebnisse geben dementsprechend keinen Hinweis darauf, dass ältere, erfahrenere Unternehmen eine höhere Performance erzielen als jüngere, tendenziell unerfahrenere Unternehmen. Der statistisch signifikante und positive Einfluss der Anlagenintensität auf die Unternehmensperformance lässt den Schluss zu, dass Unternehmen mit einer hohen langfristigen Kapitalbindung eine höhere Performance erzielen als Unternehmen mit einem geringen Anteil materieller Vermögenswerte und entsprechend geringerer langfristiger Kapitalbindung. Die Variable Unternehmenswachstum zeigt lediglich bei Verwendung des Performance-Maßes RoE einen schwach signifikanten und positiven Einfluss auf die Unternehmensperformance.

Insgesamt zeigen die Ergebnisse der multivariaten Untersuchung einen positiven Einfluss von Eigenkapitalbeteiligungen des Managements auf die Unternehmensperformance. Gleichwohl soll das mit der Analyse in unmittelbaren Zusammenhang ste-

hende Endogenitäts- bzw. Kausalitätsproblem an dieser Stelle nicht ungenannt bleiben.[31] Entsprechend der Theorie des vollkommenen Kapitalmarktes und der darin wirkenden Wettbewerbskräfte wählt jedes Unternehmen unmittelbar seine wertmaximierende Eigentümerstruktur. Neben anderen Faktoren wäre die Eigentümerstruktur demnach im Wesentlichen durch die Unternehmensperformance beeinflusst, und nicht umgekehrt.[32] Dies zugrunde gelegt ist die Beantwortung der Frage, ob die Performance eines Unternehmens von der gegenwärtigen Eigentümerstruktur abhängt, ohne Bedeutung.[33] Auch die Ergebnisse der multivariaten Untersuchung sind allein noch kein hinreichender Beleg für das Vorliegen dieses Kausalzusammenhangs.[34] Um diesem Umstand Rechnung zu tragen wird im Folgenden als Alternative zu dem in Gleichung (1) dargestellten Re-

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31 Zum Endogenitätsproblem im Allgemeinen, vgl. http://download.springer.com/static/pdf/442/chp%253A10.1007%252F978-3-322-96406-9_17.pdf?auth66=1397645668_77a68efa83eea7dedf353ae94e2da7ad&ext=.pdf, abgerufen am 14.04.2014. Zum Endogenitätsproblem im Zusammenhang mit der Untersuchung des Einflusses von Eigenkapitalbeteiligungen des Managements auf die Unternehmensperformance, vgl. Demsetz, Journal of Law and Economics 26(2)/1983, The Structure of Ownership and the Theory of the Firm S. 375 (390); Demsetz/Lehn, Journal of Political Economy 93(6)/1985, The Structure of Corporate Ownership: Causes and Consequences S. 1155 (1177); Agrawal/Knoeber, The Journal of Financial and Quantitative Analysis 31(3)/1996, Firm Performance and Mechanisms to Control Agency Problems between Managers and Shareholders S. 377 (397); Loderer/Martin, Journal of Financial Economics 45(2)/1997, Executive stock ownership and performance tracking faint traces S. 223 (255); Cho, Journal of Financial Economics 47(1)/1998, Ownership structure, investment, and the corporate value: An empirical analysis S. 103 (121); Himmelberg/Hubbard/Palia, Journal of Financial Economics 53(3)/1999, Understanding the determinants of managerial ownership and the link between ownership and performance S. 353 (384); Demsetz/Villalonga, Journal of Corporate Finance 7(3)/2001, Ownership structure and corporate performance S. 209 (233); Palia, Review of Financial Studies 14(3)/2001, The Endogeneity of Managerial Compensation in Firm Valuation: A Solution S. 735 (764); Coles/Lemmon/Meschke, Journal of Financial Economics 103 (1)/2003, Structural models and endogeneity in corporate finance: The link between managerial ownership and corporate performance S. 149 (168); Cheung/Wei, Journal of Corporate Finance 12(5)/2006, insider ownership and corporate performance: Evidence from the adjustment cost approach S. 906 (925).

32 Vgl. Kaserer/Moldenahauer, Review of Managerial Science 2(1)/2008, Insider ownership and corporate performance: evidence from Germany S 1 (35).

33 Vgl. Stigler/Friedland, Journal of Law and Economics 26(2)/1983, The literature of economics: the case of Berle and Means S. 237 (268); Demsetz/Lehn, Journal of Political Economy 93(6)/1985, The Structure of Corporate Ownership: Causes and Consequences S. 1155 (1177).

34 Bei der in der multivariaten Untersuchung verwendeten Regressionsanalyse handelt es sich um ein strukturprüfendes und nicht um ein strukturentdeckendes Verfahren. Dementsprechend ist die Regressionsanalyse ungeeignet nach Kausalzusammenhängen zu suchen. Vielmehr dient die Regressionsanalyse dazu ein auf Kausalzusammenhängen aufbauendes Modell zu überprüfen. Die Korrelation zweier Variablen ist demnach lediglich eine notwendige, aber noch keine hinreichende Bedingung für das Vorliegen eines kausalen Zusammenhangs. Zu den Herausforderungen und Möglichkeiten der Nachweiserbringung von Kausalzusammenhängen in der empirischen Rechnungslegungsforschung, vgl. Gassen, Accounting, Organizations and Society 2013, Causal inference in empirical archival financial accounting research S. 1 (10).

gressionsmodell ein sog. Change-Modell gerechnet. Die Struktur des Change-Modells gleicht dem Regressionsmodell in Gleichung (1). Anders als im ursprünglichen Regressionsmodell wird beim Change-Modell jedoch der Einfluss von Veränderungen der von Managern in Prozent gehaltenen Eigenkapitalanteile auf Veränderungen der Unternehmensperformance gemessen.[35] Der statistische Nachweis eines solchen Wirkungszusammenhangs kann zumindest als deutliches Anzeichen für das Vorliegen des im vorliegenden Beitrag vermuteten Kausalzusammenhangs verstanden werden.[36] Tabelle 5 zeigt die Ergebnisse des Change-Modells.

Tab. 5: Ergebnisse des Change-Modells

| **Variable** | **RoA_Change** | **RoE_Change** |
|---|---|---|
| *Managerbet.* $_{change}$ | 0.24489 ** | 0.62193 * |
| *ln(Bilanzsumme)* $_{change}$ | 0.22689 ** | 0.33703 * |
| *Fremdkapitalquote_* $_{change}$ | -0.41081 *** | -1.36667 *** |
| *ln(Unternehmensalter)_* $_{change}$ | -0.02704 | 0.24894 |
| *Anlagenintensität_* $_{change}$ | 0.10128 | -0.28962 |
| *Unternehmenswachstum_* $_{change}$ | -0.00422 | 0.05968 |
| **Unternehmensjahre** | 464 | 464 |
| **Korrigiertes R-Quadrat** | 0.2474 | 0.1006 |

****, ** und * bezeichnen dabei Signifikanz auf 1%-, 5%- und 10%-Niveau.*

Tab. 5: Ergebnisse des Change-Modells

[35] Die Veränderung ergibt sich aus der Differenz zwischen dem Wert der jeweiligen Variablen zum Zeitpunk$_t$ und dem Wert der jeweiligen Variablen zum Zeitpunkt$_{t-1}$.

[36] McConnell/Servaes/Lins, Journal of Corporate Finance 14(2)/2008, Changes in insider ownership and changes in the market value of the firm S. 92 (106)

Insgesamt wurden 464 Unternehmensjahre in die Untersuchung einbezogen.[37] Das Modell mit RoA (RoE) als endogene Variable weist ein korrigiertes R-Quadrat in Höhe von 24,74 % (10,06 %) auf. In Hinsicht auf die Untersuchungsvariable Manager-bet.$_{change}$ zeigen die Ergebnisse auch hier unabhängig von der Wahl des Performance-Maßes (RoA und RoE) einen statistisch signifikanten und positiven Einfluss von am Eigenkapital des Unternehmens beteiligten Managern auf die Unternehmensperformance.

## 6 Zusammenfassung

Der hier vorliegende Beitrag schließt die Forschungslücke der Auswirkung von Eigenkapitalbeteiligungen des Managements auf die Unternehmensperformance für Deutschland. Neben der seit 2005 verpflichtenden Anwendung der IFRS und den Folgen der Finanzmarktkrise umfasst der Untersuchungszeitraum der vorliegenden empirischen Analyse auch den seit 2009 durch den Erlass des VorstAG[38] zunehmenden Trend das Management zu einer Investition in eigene Aktien zu verpflichten. Die bisherige, vornehmlich internationale Literatur findet grundsätzlich einen positiven Einfluss von am Eigenkapital beteiligten Managern auf die Performance ihrer Unternehmen. Die Ergebnisse der multivariaten Untersuchung dieses Beitrags stehen in keinem Widerspruch dazu. Unter Verwendung zwei verschiedener Performance-Maße (RoA und RoE) konnte gezeigt werden, dass es einen positiven Zusammenhang zwischen Beteiligungen des Managements am Eigenkapital des Unternehmens und der Unternehmensperformance gibt. Dass dieser positive Zusammenhang tatsächlich auf die im vorliegenden Beitrag vermutete Kausalität zurückzuführen ist, legen die Ergebnisse des Change-Modells zumindest nahe. Insgesamt lassen die Ergebnisse dieses Beitrags den

[37] Die Reduzierung der Stichprobe von ursprünglich 869 auf nun 464 Unternehmensjahre ist dem Umstand geschuldet, dass für die Berechnung der Veränderung der jeweiligen Variablen nicht für alle Beobachtungen entsprechende Vorjahreszahlen verfügbar waren.

[38] Vgl. BGBl Jahrgang 2009 Teil I Nr. 50 S. 2509 (2511).

Schluss zu, dass Eigenkapitalbeteiligungen des Managements ein wirkungsvolles Instrument zu sein scheinen eine Interessenharmonisierung zwischen Manager und Aktionär herbeizuführen. Vor diesem Hintergrund wäre es wünschenswert, wenn die durch die Bundesregierung am 05.08.2009 formulierte und im VorstAG[39] festgehaltene Forderung nach einer auf eine nachhaltige Unternehmensentwicklung ausgerichteten Vergütungsstruktur in dieser Form weiter nachgekommen wird. Letztendlich bleibt die Frage, inwieweit alternative Anreizsysteme als die im vorliegenden Beitrag dargelegte Eigenkapitalbeteiligung des Managements bzw. eine Kombination verschiedener Anreizsetzungen ebenfalls dazu geeignet sind, eine wirkungsvolle Interessenharmonisierung zwischen Manager und Aktionär im bekannten Prinzipal-Agenten-Konflikt zu bewirken. Die Ergebnisse dieser Arbeit sollten eine Basis für weiterführende Diskussionen diesbezüglich bieten.

[39] Vgl. BGBl Jahrgang 2009 Teil I Nr. 50 S. 2509 (2511).

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# Teil 5: The Impact of External and Internal Corporate Governance Mechanisms on Agency Costs


**SUMMARY**

The current study applies statistical frontier analysis, a relatively new approach to estimate agency costs, and examines its association with internal and external corporate governance mechanisms. The results indicate that an industry specialized audit firm, the presence of a large audit firm, abnormal audit fees, management ownership, and variable management compensation are significantly negatively associated with the level of a firm's agency costs. In contrast, this seems not to be true for the existence of an audit committee for which my empirical evidence documents a non-significant association. In conclusion, I am able to contribute to the literature by documenting that quality-differentiated audits are an effective external corporate governance mechanism which reduces agency problems beyond internal corporate governance mechanisms, and thus, serve an important economic function.

## Contents

# 1 Introduction

A vast amount of prior literature has investigated the effects of corporate governance mechanisms on agency costs (e.g., Larcker et al. 2007; Dey 2008). While the majority of that research uses performance measures as surrogates of agency costs (e.g., Ang et al. 2000; Florackis and Ozkan 2009), most of those studies were not able to provide convincing evidence that corporate governance affects firm performance or agency costs, respectively (e.g., Renders and Gaeremynck 2006; Larcker et al. 2007; Dey 2008; Bozec et al. 2010). Hence, recent financial research has started to develop more direct estimates of the magnitude of agency costs (e.g., Habib and Ljungqvist 2005; Nguyen and Swanson 2009; Bozec et al. 2010; Chung et al. 2012)[1], an issue of interests since the seminal work of Jensen and Meckling (1976). These direct estimates are based on the idea that each firm has a hypothetical maximum value which could be obtained from its best-performing peer (Ang et al. 2000). One methodology for calculating this hypothetical benchmark is stochastic frontier analysis. The shortfall from this benchmark, measured as the difference between the hypothetical maximum firm value and the actual firm value provides the level of inefficiency of the firm or agency costs, respectively. In this context, prior literature has documented that internal corporate governance mechanisms and managerial incentives are generally able to mitigate agency costs (e.g., Habib and Ljungqvist 2005; Chung et al. 2012).

The concurrent study extends prior research by investigating the role of quality-differentiated audits as an external corporate governance mechanism potentially affecting the level of a firm's agency costs. Thus, I contribute to the literature by examining potentially relevant mechanisms which lie beyond internal corporate governance mech-

[1] While the studies of Habib and Ljungqvist (2005), Nguyen and Swanson (2009) and Chung et al. (2012) use stochastic frontier analysis (SFA) to measure firm performance/efficiency or agency costs, respectively, the study of Bozec et al. (2010) use data envelopment analysis (DEA).

anisms and managerial incentives. Thereby, the study is motivated by several factors. First, the research design of this study is to the best of my knowledge the first that investigates the influence of different corporate governance mechanisms on the level of agency costs. Second, previous research studies in this field tend to analyze the corporate governance effects on agency costs either in a more general manner limited to a small number of individual corporate governance determinants. My study is aimed to combine the two types of research approaches by examining the effects of newly defined governance mechanisms (e.g., abnormal audit fees) and a wide range of known governance determinants (e.g., management ownership and remuneration) on agency costs. Finally, previous studies are mainly focused on the United States (U.S.) audit market. This focus on the U.S. audit market leaves uncertainties regarding the direction and magnitude of the empirical relationship in the European and German environmental context, respectively. Therefore, my study is among other things aimed to provide initial empirical evidence for a sample of German IFRS listed companies.

To examine the association of internal and external corporate governance mechanisms with agency costs, I proceed as follows: First, agency costs are determined at the individual firm level by using a statistical frontier analysis approach. Second and in accordance with prior literature (e.g. Choi et al. 2010; Krauss et al. 2014), I estimate a model to come up with abnormal audit fees, which are used as a variable of interest in my main analysis. Third, the association between several internal and external corporate governance mechanisms and agency costs is examined. Finally, I investigate the robustness of my findings by sensitivity analyses.

My findings support the relevance of quality-differentiated audits by documenting that abnormal audit fees, industry specialized auditors as well as large audit firms are able to reduce the level of agency costs. In conjunction with previous work, I find

management ownership, variable management remuneration, and the presence of an options program also to be negatively associated with agency costs. However, the empirical evidence suggests that the existence of an audit committee is not associated with agency costs indicating that the pure installation of this corporate body does not necessarily mitigate agency conflicts.

The remainder of this paper is organized as follows. The following Section 2 reviews prior literature on measuring agency costs as well as the role of corporate governance mechanisms. In Section 3 the research hypotheses and study approach are discussed. Section 4 presents the empirical analyses, while Section 5 concludes the paper.

## 2. Background and Hypotheses

### 2.1 Prior Literature on Measuring Agency Costs

Since the seminal paper of Jensen and Meckling (1976), agency costs – arising from incomplete alignment of the agent's and owner's interests – were brought to attention by a wide variety of literature. However, there is still dissent in the empirical literature about the appropriate approach in order to measure the magnitude of agency costs (Ang et al. 2000). The majority of previous studies in this research field uses performance measures as surrogates of agency costs such as Tobin's Q, return on assets or stock market price (e.g., Mehran 1995; Cole and Mehran 1998; Himmelberg et al. 1999), expense ratio and asset utilization ratio (e.g., Ang et al. 2000; Singh and Davidson 2003; Florackis 2008), and asset turnover and selling, general and administrative expense ratio (e.g., Florackis 2008; Florackis and Ozkan 2009).

According to Jensen and Meckling (1976), conflicts of interests between different stakeholders induce agency costs which, in turn, impede a firm to reach the best practice relative to its peers (Quader 2013). Given that these best practice peers have

minimized agency costs, the firm's shortfall from these best practice peers can be interpreted as agency costs (Quader 2013). Ang et al. (2000) estimate such shortfall for small corporations. In accordance with Jensen and Meckling (1976) the authors consider a hypothetical 100% manager-owned firm as their zero agency costs benchmark. Every deviation from either the expense ratio or the asset utilization from a firm with a certain ownership and management structure to the corresponding ratios of the zero agency cost benchmark is interpreted as agency costs. The main disadvantage of this study approach is the absence of an obvious and realistic benchmark. Because 100% management ownership is quite unlikely for large corporations, there is no correspondent to their study outside of small corporations (Habib and Ljungqvist 2005). Thus, the empirical study results may not be generalizable to large listed companies.

Against this background, and due to the fact that prior empirical research was not able to provide convincing evidence that corporate governance affects firm performance or agency costs, respectively (e.g., Renders and Gaeremynck 2006; Larcker et al. 2007; Dey 2008; Bozec et al. 2010), recent developments in this research field consider efficiency measures which are more aligned with the theoretical definition of agency costs (Quader 2013). Based on financial data the latest developed efficiency measures provide information about the closeness of a firm's performance to the performance of a hypothetical best-practice firm which operates under the same exogenous conditions. The performance of the hypothetical best-practice firm is then considered as a reasonable benchmark for minimized agency costs (Berger and Bonaccorsi di Patti 2006).

A common method to compute a firm's efficiency is stochastic frontier analysis. Nevertheless, there are still only a few studies which have applied stochastic frontier analysis, so far. For instance, Habib and Ljungqvist (2005), Pawlina and Renneboog (2005) and Nguyen and Swanson (2009) use stochastic frontier analysis to compute an

estimate of the magnitude of agency costs by comparing a firm's actual Tobin's Q with its best performing benchmark Q (Quader 2013). According to Ang et al. (2000), the authors interpret every deviation from the best performing benchmark as agency costs. Their results show that the average firm's shortfall from its best performing benchmark amounts to 16% (Habib and Ljungqvist 2005), 15.4% (Pawlina and Renneboog 2005) and 30% (Nguyen and Swanson 2009), respectively.

## 2.2 Agency Costs and Corporate Governance Mechanisms

Corporate governance comprises internal and external control mechanisms that are aimed to bring management and shareholder interests into line. This definition is supported by several studies in this research field (e.g., Jensen 1993; Bushman and Smith 2001; Holderness 2003). Consequently, the demand for these corporate governance mechanisms is likely to be higher for firms with greater magnitude of agency costs or agency conflicts, respectively. In other words, agency costs and firms' corporate governance mechanisms are expected to be associated with each other (Dey 2008; Armstrong et al. 2010). Thus, higher levels of agency costs will result in an increased internal and/or external corporate governance structure, respectively.

There is a vast amount of prior literature investigating the effects of corporate governance mechanisms on several economic and accounting outcomes.[2] Dey (2008) investigates the association between corporate governance and agency conflicts. Using principal component analysis, the author selects 22 individual corporate governance variables to obtain seven main factors that represent the different dimensions of a firm's corporate governance structure. The results show that firms with heightened agency conflicts have better corporate governance mechanisms in place, particularly related to

[2] For a more detailed review of corporate governance literature Larcker et al. (2007) refers to the studies of Shleifer and Vishny (1997), Bushman and Smith (2001), and Bhagat and Black (2002).

the composition and functioning of the board of directors, the audit committee, and the independence of the auditor. Larcker et al. (2007) also use principal component analysis and investigate the impact of 14 corporate governance dimension from 39 individual governance indicators on several economic and accounting outcomes. The results show that these corporate governance dimensions have some association with abnormal accruals, a weak association with accounting restatements, but a strong association with future operating performance and future excess stock returns. Other studies focus on specific corporate governance mechanisms in order to test their individual effects on various accounting and economic measures. Bushman et al. (2004) provide evidence that board structures, director equity incentives, executive compensation, and ownership concentrations differ with regard to firms' information system and with firms' organizational complexity. Klein (2002) provides evidence for a negative effect of both audit committee and board independence on the level of abnormal accruals (i.e., earnings management). The author also shows that the effect is heightened when either the audit committee or the board has a minority of outside directors. Singh and Davidson (2003) investigate the effect of corporate ownership structure and the size and composition of the board of directors on agency costs. The authors find that management ownership is negatively associated with agency costs whereas the appropriateness of outside block ownership in reducing agency costs is only limited. With regard to board characteristics the authors show that large board size leads to efficiency losses (i.e., increased agency costs). Florackis (2008) investigates the impact of corporate ownership structure, capital structure, board structure and management compensation structure on agency costs. The author find, among others, that management ownership is negatively associated with agency costs whereas ownership concentration is not significantly associated with agency costs. The author further finds the management compensation structure to be nega-

tively associated with the firm's agency costs. Francis and Wilson (1988) and DeFond (1992) analyze the association between agency costs and the demand for quality-differentiated audits. DeFond (1992) uses auditor changes on the audit market in the United States in order to investigate the relationship between those two factors. The results show that changes in management ownership and leverage are significantly associated with changes in audit quality. Francis and Wilson (1988) show that the following corporate governance mechanisms are significantly positively associated with the demand for quality-differentiated audits: (1) monitoring of incentive performance contracts, (2) ownership diffusion, (3) owner-debt holder conflict, and the (4) issue of securities or equity titles, respectively. Prior to the studies of Francis and Wilson (1988) and DeFond (1992) the demand for audit quality differentiated audits in an agency cost setting has been investigated by Palmrose (1984).[3]

More recent, a few studies consider efficiency measures, calculated by using stochastic frontier analysis, as surrogates of agency costs. In this context, Habib and Ljungqvist (2005) find that an insufficient composition of firm provided managerial incentives results in decreased firm efficiency and, therefore, in increased agency costs. In this context the authors show that CEOs in the U.S. own too little stocks, too many options and that the options they hold are insufficiently to risk. Chung et al. (2012) use the same approach and find that institutional ownership has a positive impact on firm efficiency or agency costs, respectively. Finally, Bozec et al. (2010) use the ROB index which reflects four dimensions of corporate governance (i.e., board composition, compensation, shareholder rights, and disclosure) and investigate its impact on corporate efficiency. The authors find that better governed firms are more efficient than their

[3] For further studies on the association of corporate governance with agency costs, please refer to Ang et al. (2000), Florackis and Ozkan (2009), McKnight and Weir (2009), Gul et al. (2012), Siddiqui et al. (2013), and Hastori et al. (2015).

counterparts. The authors also show that there is no significant association observable when using traditional performance measures (i.e., Tobins Q) indicating efficiency measures to be the most adequate proxies for the theoretical definition of agency costs.[4]

Overall, there is a significant number of previous empirical studies that investigate the effects of corporate governance mechanisms on several economic and accounting outcomes. However, these studies mainly investigate the effects either in a more general manner (e.g. Larcker et al. 2007; Dey 2008) or are based on specific and individual corporate governance determinants. My study is aimed to close that gap between those two types of research approaches by examining the effects of newly specified governance mechanisms (e.g., abnormal audit fees) and a wide range of known governance determinants (e.g., auditor size, management ownership) on agency costs. That enables me to draw conclusions about the appropriateness of diverse corporate governance mechanisms in mitigating agency costs within one institutional setting and, therefore, allows a better interpretation of the results. Furthermore, previous studies have mainly focused on the U.S. environmental context. This focus leaves uncertainties regarding the direction and magnitude of the empirical relationship in the European and German environmental context, respectively. For example, the German environmental context is characterized by weaker investor protection as well as by a lower level of corporate governance compared to the U.S. (e.g., La Porta et al 2000; Leuz et al. 2003). Therefore, my study is among other things aimed to provide initial empirical evidence for a sample of firms from a country with a generally weak investor protection and corporate governance structure.

[4] While the studies of Habib and Ljungqvist (2005) and Chung et al. (2012) use stochastic frontier analysis (SFA) to measure firm performance/efficiency or agency costs, respectively, the study of Bozec et al. (2010) use data envelopment analysis (DEA).

# 3. Hypotheses and Research Design

## 3.1 Hypothesis Development

The current study is to the best of my knowledge the first to investigate the influence of different corporate governance mechanisms on the level of agency costs by using the statistical frontier analysis approach. In particular, my research approach distinguishes between internal and external corporate governance mechanisms that are assumed to affect a firms' agency costs. As external corporate governance mechanisms, I consider the demand for audit services, the engaged audit firm type, and the engagement of an industry specialized audit firm. Internal corporate governance mechanisms are deemed to be management ownership, the existence of an audit committee as well as variable management compensation arrangements and the existence of a stock option program. For each of these corporate governance determinants, I develop the following separate hypotheses.

### 3.1.1 External Corporate Governance Mechanisms

*Audit fees*

Jensen and Meckling (1976) highlight the importance of external auditing as a monitoring mechanism in order to curb agency conflicts. In the German two-tier corporate governance system the monitoring task of the supervisory board also comprises the examination of financial reporting. This examination is supported by the findings and remarks of the engaged statutory auditor. Thus, the statutory auditor can be considered as a close partner of the supervisory board (Koehler et al. 2008; Quick and Warming-Rasmussen 2009). Regarding the quality of the external audit, higher audit fees are expected to result in an increased audit effort by the statutory auditor (Gupta et al. 2009; Blankley et al. 2012). Consequently, abnormal audit fees should decrease information

asymmetry between owners and managers. However, monitoring by external auditors may be compromised when unusual audit fees are paid by the client due to an economic auditor-client bonding. In this context, Dye (1991) and DeFond et al. (2002) argue that audit quality could be impaired when fee rents or abnormal high audit fees are paid to the statutory auditor (Choi et al. 2010; Krauss et al. 2014). Thus, information asymmetries between owners and managers as well as the corresponding agency costs are not likely to be reduced by such external audit characteristics (Palmrose 1984). Based on the aforementioned arguments, I am unable to provide a satisfying prediction about the potential agency cost effects of abnormal audit fees. Therefore, I test the following non-directional hypothesis:

**Hypothesis (1):** Abnormal audit fees are not associated with agency costs.

*Auditor size and industry specialization*

Prior audit research suggests that larger audit firms (e.g., Big 5) provide a higher quality audit product than small or medium sized audit firms, respectively (DeAngelo 1981; Palmrose 1986; Craswell et al. 1995). Regarding agency costs, the audit quality differentiation between the two auditor types could be a meaningful mechanism in reducing agency risks due to an improved quality of firms' financial reporting (Francis and Wilson 1988; DeFond 1992; Dey 2008). In addition and referring to the study of Shockley and Holt (1983), DeFond (1992) states that an industry specialized audit firm should be able to provide higher audit quality than a non-specialized auditor. This is because industry specialized audit firms have gained enhanced audit expertise in their field and, therefore, are able to fulfill their monitoring function more effectively than other auditors. Accordingly, agency costs of such audits should be lower than for audits conducted by non-industry specialists. In order to test for the auditor industry speciali-

zation, and respectively, auditor size effect on agency costs, I posit the following two hypotheses:

**Hypothesis (2):** Auditor size is negatively associated with agency costs.

**Hypothesis (3):** The engagement of an industry specialized audit firm is negatively associated with agency costs.

### 3.1.2 Internal Corporate Governance Mechanisms

*Management ownership*

Jensen and Meckling (1976) demonstrate that an increase in management ownership leads to decreased agency costs. The authors argue that owner-managers have the opportunity to directly participate in entrepreneurial gains and, therefore, have the same incentive to increase the firm value as the other owners or shareholders of the company, respectively (alignment theory). In other words, the higher the management ownership the more closely aligned are the interests of the two parties which should results in reduced agency costs (DeFond 1992). On the contrary, increasing management ownership may increase agency costs. Managers holding a significant portion of the shares could act in a personally beneficial manner without considering outside shareholders (entrenchment theory). Thus, managers restrict the flow of information to outside shareholders which leads to increased agency costs. As a consequence of the theoretical discussion, I am unable to provide a satisfying prediction about the potential agency cost effects of management ownership. Therefore, I test the following non-directional hypothesis:

**Hypothesis (4):** Management ownership is not associated with agency costs.

*Audit committee*

Audit committees have been shown to improve the quality of corporate decision-making processes and, hence, firms' corporate governance in several ways. In particular, companies with an audit committee are expected to provide an appropriate financial reporting quality (Vafeas 2005; Krishnan and Viswanathan 2008; Cai et al. 2015). In addition, the implementation of an audit committee is also expected to have a positive impact on the following accounting and audit practices: (1) earnings management (Klein 2002; Xie et al. 2003), (2) the auditor-client relationship (Abbott et al. 2007; Lennox and Park 2007), (3) disclosure practices (Archambeault et al. 2008), and (4) internal control practices (Krishnan 2005; Hoitash et al. 2009). Based on the aforementioned arguments, I posit the following hypothesis:

**Hypothesis (5):** The existence of an audit committee is negatively associated with agency costs.

*Management remuneration*

Shareholders are anxious to sign management contracts that help to curb the divergence of interests between managers and owners. Therefore, such contracts often contain arrangements that for example vary with firm performance (Palmrose 1984). Similar to the aforementioned effects of management ownership, variable compensation contracts could effectively change managers behavior as they directly participate from a positive firm performance and, therefore, have an identical interest as the owners of the company. Francis and Wilson (1988) state in this context that the use of incentive compensation contracts could improve management performance and thereby reduce agency costs. However, the use of incentive compensation contracts could also results in additional monitoring or audit costs, respectively (Watts and Zimmerman 1983).

In addition to variable management compensation, stock options have become an important remuneration component in the managerial incentive schemes (Habib and Ljungqvist 2005). The effects of offered stock options should result in qualitative similar management incentives than variable compensation agreements described above. Based on the aforementioned arguments, I am unable to provide a satisfying prediction about the potential agency cost effects of variable management remuneration. Therefore, I test the following non-directional hypotheses:

**Hypothesis (6):** Variable management remuneration is not associated with agency costs.

**Hypothesis (7):** Stock options are not associated with agency costs.

## 3.2 Empirical Model

As prior literature considers efficiency measures to be the most adequate proxies for the theoretical definition of agency costs (see Section 2.1), I follow the research approach of Habib and Ljungqvist (2005), Pawlina and Renneboog (2005), Nguyen and Swanson (2009) and Chung et al. (2012). Accordingly, I use stochastic frontier analysis to compute an estimate of the magnitude of agency costs (AC) by comparing a firm's actual Tobin's Q with its best performing benchmark $Q^*$ (Chung et al. 2012). Thereby, the benchmark $Q^*$ represents a hypothetical value (Chung et al. 2012). The firm's actual $Q$ can be either equal or smaller than the hypothetical benchmark $Q^*$ (Chung et al. 2012). The firm's actual $Q$ has been maximized if it lies on the frontier and, therefore, equals to the optimal hypothetical $Q^*$ (Chung et al. 2012). If this is the case, the manager acts in the best interest of the shareholders and all operating and investment decisions are conducted optimally – there are no agency costs (Chung et al. 2012). Otherwise, if the manager is prevented from maximizing firm value and, therefore, the firm's actual

*Q* lies below the frontier and is smaller than its hypothetical benchmark *Q**, the shortfall from the frontier (*Q**-*Q*) suggests inefficiency and is a measure of agency costs (Habib and Ljungqvist 2005; Chung et al. 2012).

It should be emphasized that by definition of a frontier, firms can be located either on the frontier or below it, but they can never be located above the frontier (Habib and Ljungqvist 2005). Stochastic frontier analysis captures this asymmetry in the distribution of firms by supplementing the conventional two-sided error term ($v_{it}$) used in ordinary least square methods (OLS) with a one-sided error term ($u_{it}$) (Habib and Ljungqvist 2005). This second term is zero ($u_{it} = 0$) for firms that achieve the highest *Q* and, therefore, maximize firm value but strictly positive ($u_{it} > 0$) for those firms that do not maximize firm value and, therefore, fail to achieve the highest *Q* that could be achieved given their opportunity set (Habib and Ljungqvist 2005). The variable $u_{it}$ therefore corresponds to the shortfall in a firm's actual valuation (Habib and Ljungqvist 2005). To estimate the benchmark *Q** of a comparable but value-maximizing firm, I estimate the frontier using stochastic frontier analysis. To construct my benchmark *Q**, I select variables used in prior studies (Habib and Ljungqvist 2005; Pawlina and Renneboog 2005; Nguyen and Swanson 2009; Chung et al. 2012) that can determine firm efficiency and also control for differences in firm's characteristics and opportunity sets (Chung et al. 2012). Equation (1) presents the shortfall (inefficiency) from the frontier which I relate to agency costs (AC).

Equation (1):

$$Q_{it}^{*} = \beta_0 + \beta_1(LNSALES_{it}) + \beta_2(GROWTH_{it}) + \beta_3(LEVERAGE_{it}) + \beta_4(OCFSCALED_{it}) + \beta_5(RNDSCALED_{it}) + \beta_6(RNDSCALEDMISS_{it}) + \varepsilon_{it}$$
$$whereas\ \varepsilon_{it} = v_{it} - u_{it}$$

All variables are defined in Appendix I. Appendix II presents the results of estimating Equation (1). Performing stochastic frontier analysis enables me to measure a firm's performance shortfall for each firm and for each year by using the predicted value of $u_{it}$ (Habib and Ljungqvist 2005). To assure that the shortfall from the frontier (i.e., inefficiency) lies between 0 and 1, I normalize the shortfall by taking the ratio of a firm's shortfall (i.e., inefficiency) to the corresponding optimal benchmark *Q** (Chung et al. 2012). Similar to Habib and Ljungqvist (2005) and Chung et al. (2012), the shortfall or inefficiency, respectively, will also be [1 – *predicted efficiency*] where *predicted efficiency* is the ratio of a firm's actual Q to the corresponding optimal benchmark Q* of a comparable but value-maximizing firm. Equation (2) specifies the normalization procedure.[5]

Equation (2):

$$Inefficiency = AC = \frac{u_{it}}{Q_{it}^*} = 1 - \frac{Q_{it}}{Q_{it}^*}$$

To test my seven hypotheses described in Section 3.1, I posit the following regression model in Equation (3). The variables used in the estimation model are defined in Appendix I.

Equation (3):

$$\begin{aligned} AC = {} & \beta_0 + \beta_1(ABAFEE) + \beta_2(INDSPEC) + \beta_3(BIG5) + \beta_4(INDSPEC * BIG5) + \\ & \beta_5(MANAGOWN) + \beta_6(AUDCOM) + \beta_7(BONUSRATIO) + \\ & \beta_8(OPTION) + \beta_9(GROWTH) + \beta_{10}(LNTA) + \beta_{11}(LEVERAGE) + \\ & \beta_{12}(ROA) + industry\ and\ year\ fixed\ effects + \varepsilon_i \end{aligned}$$

[5] Note, that the verbal description of the stochastic frontier analysis procedure mentioned above is in conformity with the one of Habib and Ljungqvist (2005) and Chung et al. (2012).

The model is linking the magnitude of agency costs (i.e., AC) with my variable of interests: namely abnormal audit fees (ABAFEE)[6], industry specialized audit firm (INDSPEC), Big 5 audit firm (BIG5), management ownership (MANAGOWN), audit committee (AUDCOM), variable management compensation (BONUSRATIO), and management stock options (OPTION). In addition, I include four firm-specific independent control variables (i.e., GROWTH, LNTA, LEVERAGE, and ROA) which are drawn from previous studies in this research field (e.g., Francis and Wilson 1988; DeFond 1992; Larcker et al. 2007, Dey 2008). Finally, the model contains 10 industry indicator variables as defined by Frankel et al. (2002) and modified by Ernstberger et al. (2015).[7] The model is estimated using a pooled sample of 886 firm-year observations and includes industry-fixed effects as well as year-fixed effects to control for potential industry- and year-heterogeneity.

# 4. Sample Description and Empirical Analyses

## 4.1 Sample

For my analyses, I use data from German non-financial firms with IFRS consolidated financial statements that were listed in the regulated market of the Frankfurt Stock Exchange during 2006-2011. Because my study takes place within the same institutional setting, I automatically control for institutional factors and regulatory requirements (Ernstberger 2008). Financial data was obtained from the *Thomson Reuters*

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[6] Appendix III presents the results of estimating abnormal audit fees. The audit fee model contains a wide variety of independent variables which were already used in prior literature (e.g., DeFond et al. 2002; Gul et al. 2003; Hay et al. 2006; Choi et al. 2010; Krauss et al. 2014). Abnormal audit fees (ABAFEE) then derived from the residuals ($\varepsilon_i$) of the model.

[7] According to Ernstberger et al.'s (2015) modifying Frankel et al.'s (2002) industry membership to a German context, the classification is defined by SIC code as follows: agriculture (0100-0999), mining and construction (1000-1999, excluding 1300-1399), consumer manufacturers (2000-2111, 2200-2799), chemicals, pharmaceuticals, and refining (1300-1399, 2800-2824, 2830-2836, 2840-2899, 2900-2999), durable manufacturers (3000-3999, excluding 3570-3579 and 3670-3679), transportation (4000-4899), utilities (4900-4999), retail (5000-5999), services (7000-8999, excluding 7370-7379), and computers (3570-3579, 3670-3679, 7370-7379).

*Worldscope Database*. Audit fee data and audit committee data was obtained from the *EUR-Business Research Database* while option holding data was obtained from the *BaFin (Bundesanstalt für Finanzdienstleitungsaufsicht - Federal Financial Supervisory Authority)*. Remuneration data was collected manually from the respective financial statements of the sample firms. The financial statements were retrieved from several databases (e.g., "*www.hv-info.de*"), the firm's homepages as well as the electronic German company register ("*www.unternehmensregister.de*"). Finally, I used the *Amadeus*, a database of *Bureau van Dijk Electronic Publishing*, to calculate management ownership. In addition to financial data, *Amadeus* also contains information on the ownership structure of firms, including the names of owners and their respective ownership shares. *Amadeus* collects information from a variety of sources: (1) directly from the firm's annual reports, (2) from official bodies, (3) from press releases, (4) from regulatory authorities, and (5) from the associated information provider (e.g., *Verband der Vereine Creditreform* for Germany). In accordance with prior research, I exclude all financial firms corresponding to the SIC codes 6000-6999 because of their special accounting practices. The initial sample thus consists of 613 companies and 3,349 firm-year observations. After merging financial data with audit data, remuneration data and ownership data, I omit 2,160 firm-year observations due to missing data. This leaves a final sample of 313 companies and 1,189 firm-year observations. Panel A of Table 1 summarizes the sample adjustments mentioned above and shows the final sample composition. Panel B presents the yearly distribution of firm observations, while Panel C gives an overview of the distribution of firm observations according to Frankel et al.'s (2002) and modified by Ernstberger et al. (2015) industry classification.

**[Table 1]**

## 4.2 Descriptive Statistics and Univariate Analyses

The descriptive statistics of the variables used in Equation (3) are presented in Table 2. I winsorize all continuous variables at the 1 percent level and, respectively, 99 percent level to control for outliers. With regard to the distribution of variables shown in Table 2, it is worth noting the following facts. First, the mean (median) value of my agency costs measure (i.e., AC) amounts to 27.5 (27.6) percent and is comparable to the results of previous studies (Habib and Ljungqvist 2005; Pawlina and Renneboog 2005; Nguyen and Swanson 2009). Second, the descriptive figures for LNTA my proxy for client size shows that my average (median) sample firm has a natural log of total assets of 12.7 (12.3). Other noteworthy aspects of my sample composition are an average (median) ratio of managers' variable salary to managers' fix salary (BONUSRATIO) of 91.0 (63.7) percent, sales growth rate (GROWTH) of 9.4 (7.0) percent, financial leverage ratio (LEVERAGE) of 14.2 (6.8) percent, and a return on assets ratio (ROA) of 4.3 (4.4) percent.

Regarding the used binary variables in Equation (3) my sample shows plausible descriptive statistics. To be more precise, the results in Table 2 shows that 74.8 percent of the sample composition is audited by a Big 5 auditor, while 31.0 percent of my sample firms have engaged an industry specialized auditor (INDSPEC). These descriptive figures imply that the German audit market is dominated by five major audit firms and that large listed companies are willing to engage an industry specialized auditor. Finally it can be seen that 51.6 percent of my sample firm have installed an audit committee (AUDCOM) and 39.6 percent of the sample firms granted CEO option holdings (OPTION).

**[Table 2]**

Table 3 presents both the Pearson and the Spearman correlation matrix. With regard to my external corporate governance mechanisms the correlation matrix shows that my agency costs measure (i.e., AC) is significantly negative correlated with the two external corporate governance determinants INDSPEC ($p_s$ = - 0.0520; $p_p$ = - 0.0724) and BIG5 ($p_s$ = - 0.0605; $p_p$ = - 0.0540). With regard to my internal corporate governance mechanisms, BONUSRATIO ($p_s$ = - 0.1654; $p_p$ = - 0.1702) and OPTION ($p_s$ = - 0.0625; $p_p$ = - 0.0796) are also significantly negative correlated with AC. With regard to the remaining external and internal corporate governance mechanisms (ABAFEE, MANAGOWN, and AUDCOM) there is no significant correlation observable.

Regarding the correlations among the independent control variables used in Equation (3), it is worth noting the following: First, LNTA is significantly positive correlated with INDSPEC ($p_s$ = 0.3847; $p_p$ = 0.4194), BIG5 ($p_s$ = 0.2703; $p_p$ = 0.2805), AUDCOM ($p_s$ = 0.5645; $p_p$ = 0.5490) and BONUSRATIO ($p_s$ = 0.4895; $p_p$ = 0.5046). These correlations suggest that large firms are more likely to engage an industry specialized Big 5 auditor, have an installed audit committee and are associated with a higher ratio of managers' variable salary to managers' fix salary. Second, ROA is significantly associated with BONUSRATIO ($p_s$ = 0.3341; $p_p$ = 0.2804), GROWTH ($p_s$ = 0.3135; $p_p$ = 0.1456), and LEVERAGE ($p_s$ = - 0.3513; $p_p$ = - 0.2791). These correlations highlight the obvious fact that firms with a positive ROA are on the one hand more likely to pay higher variable management salaries and have higher sales growth rates, while these firms are on the other hand less likely to report a high leverage ratio. Finally, the two internal corporate governance variables AUDCOM and BONUSRATIO are positively associated ($p_s$ = 0.3238; $p_p$ = 0.2759) with each other. In order to eliminate any concerns about multicollinearity, I compute the variance inflation factor which lies between 1 and 3 indicating that there are no multicollinearity problems.

**[Table 3]**

## 4.3 Multivariate Analyses

Table 4 presents the results obtained by estimating Equation (3). With regard to the external corporate governance mechanisms, it can be seen that abnormal audit fees (i.e., ABAFEE) are significantly negatively associated with agency costs (i.e., AC). The correlation is significant at the 10 percent level (t-statistics = - 1.76) and indicates that higher audit fees potentially increase the audit effort by the statutory auditor and, thus, potentially decrease information asymmetry between owners and managers. In addition to ABAFEE, it can be seen that INDSPEC (i.e., the engagement of an industry specialized audit firm) is also significantly negatively associated with agency costs. The correlation is highly significant at the 1 percent level (t-statistics = - 2.65). This result suggest that industry specialized audit firms are able to provide a higher quality audit than non-specialized auditors and, therefore, are able to fulfill their monitoring function more effectively than other auditors. Finally, the results of Table 4 show a significantly negative association between the size of the audit firm (i.e., BIG5) and agency costs. This result suggests that large audit firms provide a higher quality audit than small or medium sized audit firms, respectively. Therefore, the audits of large audit firms (i.e., *KPMG, PwC, Deloitte, Ernst & Young and BDO, respectively*) seem to be a meaningful mechanism in reducing agency risks due to an improved quality of firms' financial reporting. The correlation coefficient ($Coef_{BIG5}$ = - 0.00650) shows a moderate significance at the 5 percent level (t-statistics = - 2.07). In addition to the three external corporate governance mechanisms and in accordance with Behn et al. (2008), I also add an interaction term to the regression (INDSPEC*BIG5) to determine whether the effect of

auditor industry specialization varies with auditor size.[8] From Table 4, it can be seen that the interaction term of INDSPEC and BIG5 is positive and significant at the 5 percent level (t-statistics = 2.01). This result implies that the effect of auditor industry specialization on agency costs actually varies with auditor size. Thus, industry specialization has less impact on agency costs for Big 5 auditors given that Big 5 auditors tend to have larger client base and more experience, which already negatively affect the level of agency costs. Consequently, my findings support the relevance of quality-differentiated audits by documenting that abnormal audit fees, industry specialized auditors as well as large audit firms have a negative impact on a firm's agency costs. Moreover, because in the German two-tier corporate governance system the internal monitoring task of the supervisory board also comprises the examination of financial reporting, my results also show that a quality-differentiated audit as an external corporate governance mechanism is an appropriate instrument to improve the monitoring function of the supervisory board. This is in line with Koehler et al. (2008) and Quick and Warming-Rasmussen (2009) and suggests that a high quality auditor can be considered as a close partner of the supervisory board. Finally, my results support Jensen and Meckling (1976) in highlighting the importance of external auditing as a monitoring mechanism in order to curb agency conflicts.

With regard to the internal corporate governance mechanisms, my results are almost similar to the results of prior studies on the association between corporate governance mechanism and agency costs. Accordingly, I find that management ownership (i.e., MANAGOWN) is significantly negatively associated with a firm's agency costs. This finding supports the results of Singh and Davidson (2003) and Florackis (2008).

[8] Behn et al. (2008) investigate the impact of audit quality on properties of analyst earnings forecasts. The authors also include an interaction term to determine whether the effect of auditor industry specialization on analyst forecast accuracy varies with auditor size. The authors find that the impact of industry specialization on forecast accuracy is not significantly different from zero for the clients of the Big 5.

The correlation is significant at the 1 percent level (t-statistics = - 2.83). In addition, the results of Table 4 show a significantly negative association between variable management remuneration (i.e., BONUSRATIO) and agency costs at the 1 percent level (t-statistics = - 5.21). This result is in line with Francis and Wilson (1988), Habib and Ljungqvist (2005), and Florackis (2008) and suggests that the use of incentive compensation contracts could improve management performance and thereby reduce agency costs. Taken together, I am able to confirm that managerial incentives are an effective mechanism to reduce agency conflicts between managers and owners. This is also in line with Jensen and Meckling (1976) and suggests that managerial incentives enable managers to directly participate in entrepreneurial gains, resulting in an interest alignment between managers and owners and, ultimately, in lower agency costs. This finding can also be confirmed for companies having implemented option programs. That is illustrated by the negative and highly significant correlation between OPTION and agency costs (t-statistics = - 2.98) which provide some evidence of CEOs receiving options beyond the point where the marginal cost equals the marginal benefit of doing so (e.g., Yermack 1995; Habib and Ljungvist 2005). Finally, and in contrast to prior studies (e.g., Dey 2008), I find no empirical evidence for an association between the existence of an audit committee and agency costs. This result suggest that the pure installation of this corporate body does not necessary mitigate agency conflicts.

With regard to the control variables, it can be seen that GROWTH and LNTA are significantly positively associated with agency costs whereas LEVERAGE and ROA are significantly negatively associated with agency costs. All control variables are significant at the 1 percent level.

**[Table 4]**

To strengthen the reliability of my results, I investigate the robustness of my findings by sensitivity analyses.

Prior research was not able to provide convincing evidence that corporate governance affects firm performance or value (e.g., Renders and Gaeremynck 2006; Larcker et al. 2007; Dey 2008; Bozec et al. 2010). One potential explanation for the lack of clear results could be the problem of reversed causality (Renders and Gaeremynck 2006; Bozec et al. 2010). More precisely: Corporate governance mechanisms could affect agency costs. The study at hands follows this theory by investigating the impact of external and internal corporate governance mechanisms on agency costs. Nevertheless, it is also reasonable that agency costs cause the firm to implement corporate governance mechanisms or to change its corporate governance structure. To address this problem of reversed causality, I re-estimate Equation (3) by using lagged corporate governance variables. Therefore, if agency costs are for period *t*, each of the corporate governance variables is measured at period *t-1*. This enables me to test for the direction of the relationship by examining the relation between corporate governance mechanisms and future agency costs. Table 5 shows the results of re-estimating Equation (3) by using lagged corporate governance variables. As can be seen here, the results remain qualitatively unchanged.[9]

**[Table 5]**

Equation (3) was measured by estimating a tobit regression. While the tobit regression seems to be an appropriate approach for my analyses due to my censored dependent agency costs variable (i.e., AC), an obvious alternative would be to estimate an ordinary least squares regression (OLS). Table 6 shows the results of re-estimating Equation (3) using an ordinary least squares regressions. It can be seen that the effects

[9] I also re-estimate Equation (3) by lagging all explanatory variables. The results (not tabulated) are qualitatively similar.

of corporate governance mechanisms on agency costs are qualitatively similar to those, I obtained by estimating a tobit model.

**[Table 6]**

## 5 Conclusion

Previous research on agency costs has either used non-direct measures or has not investigated the role of external *vis-à-vis* internal corporate governance mechanisms in reducing such costs. While the majority of that research uses performance measures as surrogates of agency costs, most of those studies were not able to provide convincing evidence that corporate governance affects firm performance or agency costs, respectively. The concurrent study tries to overcome these issues by applying statistical frontier analysis to estimate agency costs as the shortfall of a firm's actual value to its hypothetical maximizing value. I examine the association of the respective agency cost measure with proxies for quality-differentiated audit such as audit fees, auditor's industry specialization, auditor's size, as well as internal corporate governance mechanisms such as management ownership, management remuneration, the presence of an options program, and the existence of an audit committee.

The empirical analyses yield the following results. I find an industry specialized or large audit firm to be significantly negatively associated with the level of a firm's agency costs. Also, abnormal audit fees and the existence of an options program are negatively associated with agency costs. In conjunction with prior literature, I am also able to confirm that management ownership and managerial incentives are effective mechanisms to mitigate agency costs. However, this seems not be true for an audit committee for which my empirical evidence documents a non-significant association with agency costs. Consequently, I am able to document that quality-differentiated audits are an effective external corporate governance mechanism which reduces agency

problems beyond internal corporate governance mechanisms and, thus, serve an important economic function.

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## **Appendix I** Variable definitions

| Variable | Description |
|---|---|
| *ABAFEE* | - Abnormal audit fees |
| *AC* | - Agency costs, defined as [1 - predicted efficiency] where prdicted efficiency is the ratio of a firm's actual Q to the corresponding optimal benchmark Q* of a comparable but value-maximizing firm |
| *AUDCOM* | - Indicator variable that takes the value of 1, if the firm has an audit committee, 0 otherwise |
| *BIG5* | - Indicator variable that takes the value of 1, if the audit company is either KPMG, PwC, Deloitte, Ernst & Young or BDO, 0 otherwise |
| *BONUSRATIO* | - Variable management compensation calculated by the sum of short-term and long-term compensation divided by fix management compensation |
| *BTM* | - Book-to-market ratio (total book value of equity divided by a firms' market capitilization) |
| *BUSY* | - Indicator variable that takes the value of 1, if the fiscal year ends in December, 0 otherwise |
| *DAX* | - Indicator variable that takes the value of 1, if the company is listed in the DAX index of the Frankfurt Stock Exchange, 0 otherwise |
| *FOREIGN* | - Ratio of foreign sales to total sales |
| *GROWTH* | - Sales change from the prior to the current fiscal year |
| *IFRS* | - Indicator variable that takes the value of 1, if the company applies IFRS for the first time, 0 otherwise |
| *INDSPEC* | - Indicator variable that takes the value of 1, if the company is audited by an auditor who holds the greatest market share (based on audit fees) within an industry, location and year and has at least 10% distance to the market share of the second largest auditor within that certain industry, location and year, 0 otherwise |
| *INITIAL* | - Indicator variable that takes the value of 1, if the firm's statutory auditor is in the first audit engagement year, 0 otherwise |
| *ISSUE* | - Indicator variable that takes the value of 1, if equity titles are issued in the current fiscal year, 0 otherwise |
| *LAGLOSS* | - Indicator variable that takes the value of 1, if the prior year's net income is negative, 0 otherwise |
| *LEVERAGE* | - Book value of long-term debt divided by the sum of market value of equity and book value of long-term debt, expressed in percent |
| *LNFEE* | - Natural log of audit fees |
| *LNINVREC* | - Natural log of the sum of inventories and receivables |

## **Appendix I (continued)** Variable definitions

| Variable | Description |
|---|---|
| *LNSALES* | - Natural log of sales |
| *LNSEG* | - Natural log of the number of business segments |
| *LNTA* | - Natural log of total assets |
| *MANAGOWN* | - Percentage of shares held by managers |
| *MDAX* | - Indicator variable that takes the value of 1, if the company is listed in the MDAX index of the Frankfurt Stock Exchange, 0 otherwise |
| *NAS* | - Ratio of non-audit fees to total fees |
| *OCFSCALED* | - Operating cash flow divided by total assets |
| *OPTION* | - Indicator variable that takes the value of 1, if the company granted CEO option holdings, 0 otherwise |
| *Q** | - Tobin's Q, defined as the ratio of the value of the firm divided by the replacement value of assets. Similar to Himmelberg et al. (1999), for firm value, I use (market value of common equity + liquidation value of preferred equity + book value of total liablities) and for replacemnet value of assets, I use book value of total assets. |
| *REPORTLAG* | - Number of days between the fiscal year-end and the audit opinion date |
| *RNDSCALED* | - Research and development expenditures divided by property, plant and equipment |
| *RNDSCALEDMISS* | - Indicator variable that takes the value 1, if the data required to estimate RNDSCALED is missing, 0 otherwise |
| *ROA* | - Return on assets (net income divided by total assets) |
| *ROE* | - Return on Equity (net income divided by total equity) |
| *SDAX* | - Indicator variable that takes the value of 1, if the company is listed in the SDAX index of the Frankfurt Stock Exchange, 0 otherwise |
| *TECDAX* | - Indicator variable that takes the value of 1, if the company is listed in the TECDAX index of the Frankfurt Stock Exchange, 0 otherwise |
| *u* | - The two-sided error term in the conventional ordinary least-squares (OLS) method |
| *UTILITY* | - Indicator variable that takes the value 1, if the company opeartes in the two-digit SIC industries 40, 48, or 49 |
| *v* | - The one-sided error term |
| *ZSCORE* | - Zmijewski's (1984) financial condition index |

## **Appendix II** SFA analysis

| **Dependent variable** | *Q** | |
|---|---|---|
| **Variables** | **Coefficient** | **t-statistics** |
| *LNSALES* | -0,07326 *** | -6,05 |
| *GROWTH* | 0,25325 *** | 5,46 |
| *LEVERAGE* | -1,75182 *** | -14,93 |
| *OCFSCALED* | 0,78760 *** | 5,56 |
| RNDSCALED | 0,05523 *** | 3,09 |
| RNDSCALEDMISS | -0,23344 *** | -4,34 |
| **Firm Years** | 2.781 | |
| **Adj. $R^2$** | 0,1682 | |

**Notes:**
Appendix II presents stochastic frontier analysis estimated using maximum likelihood that includes fixed effects for industry. The model is estimated with an intercept included (not tabulated). ***, **, and * denote p-value significance at the 1%, 5% and 10% levels, with two-tailed tests. I winsorized all cotinuous variables at the 1 %, and respectively, 99 % level to control for outliers. To assess the economic significance of the used independent variables, I estimate a regression using OLS (SFA analysis do not have a goodness-of-fit measure analogous to adjusted R2). All variables are defined in Appendix I.

## **Appendix III** Audit fee model

| **Dependent variable** | *LNFEE* | |
|---|---|---|
| **Variables** | **Coefficient** | **t-statistics** |
| *LNTA* | 0.39482 *** | 24.35 |
| *LNSEG* | 0.03513 ** | 2.35 |
| *LNINVREC* | 0.07284 *** | 5.05 |
| *FOREIGN* | 0.00063 * | 1.67 |
| *LAGLOSS* | 0.12172 *** | 4.90 |
| *LEVERAGE* | 0.19849 *** | 5.22 |
| *ZSCORE* | 0.02247 *** | 3.17 |
| *GROWTH* | -0.08964 *** | -4.14 |
| *ROE* | -0.04145 ** | -2.53 |
| *BTM* | -0.03574 ** | -2.09 |
| *ISSUE* | 0.05908 *** | 2.69 |
| *BIG5* | 0.15160 *** | 6.68 |
| *INITIAL* | -0.14833 *** | -4.85 |
| *NAS* | -0.25299 *** | -5.27 |
| *REPORTLAG* | 0.00017 | 0.61 |
| *BUSY* | 0.01687 | 0.59 |
| *IFRS* | 0.00106 | 0.02 |
| *DAX* | 0.81717 *** | 11.93 |
| *SDAX* | 0.03871 | 0.88 |
| *MDAX* | 0.07007 | 1.58 |
| *TECDAX* | 0.07318 | 1.48 |
| **Firm Years** | 2,527 | |
| **Adj. $R^2$** | 0.8275 | |

**Notes:**
Appendix III presents the results of estimating OLS-regression that includes fixed effects for fiscal year and industry. The regression is estimated with an intercept included (not tabulated). ***, **, and * denote p-value significance at the 1%, 5% and 10% levels, with two-tailed tests. I winsorized all cotinuous variables at the 1 %, and respectively, 99 % level to control for outliers. All variables are defined in Appendix I.

## **Table 1** Sample description

Panel A: Sample selection process

| **Sample selection steps** | **Firm-years** | **Firms** |
|---|---|---|
| *Initial Sample:* German listed firms having IFRS financial information available in the Thomson Reuters Worldscope database (2006 trough 2011); excluding SIC Codes 6000-6700 | 3.349 | 613 |
| *less:* Merging the financial data with agency costs data, abnormal audit fee data, auditor data, audit committee data, remuneration data as well as ownership data | 2.160 | |
| Final study sample | 1.189 | 313 |

Panel B: Firm observations by year

| **Year** | **Firm-years** | **%** |
|---|---|---|
| *2006* | 156 | 13% |
| *2007* | 201 | 17% |
| *2008* | 206 | 17% |
| *2009* | 212 | 18% |
| *2010* | 212 | 18% |
| *2011* | 202 | 17% |

## **Table 1 (continued)** Sample description

Panel C: Firm observations by industry

| **Industry classification** | **Firm-years** | **%** |
|---|---|---|
| *Agriculture (SIC Codes 100-999)* | 4 | 0% |
| *Mining and construction (SIC Codes 1000-1999, excl. 1300-139* | 22 | 2% |
| *Consumer manufactures (SIC Codes 2000-2111, 2200-2799)* | 103 | 9% |
| *Chemicals, pharma and refining (SIC Codes 1300-1399, 2800-2824, 2830-2836, 2840-2899, 2900-2999)* | 67 | 6% |
| *Durable manufactures (SIC Codes 3000-3999, excl. 3570-3579 and 3670-3679)* | 431 | 36% |
| *Transportation (SIC Codes 4000-4899)* | 62 | 5% |
| *Utilities (SIC Codes 4900-4999)* | 29 | 2% |
| *Retail (SIC Codes 5000-5999)* | 80 | 7% |
| *Services (SIC Codes 7000-8999, excl. 7370-7379)* | 155 | 13% |
| *Computers (SIC Codes 3570-3579, 3670-3679, 7370-7379)* | 236 | 20% |

**Notes:**
Table 1, Panel A presents the sample selection process taken to derive the final study sample. Panel B (Panel C) reports the distribution of the sample by year (by industry).

**Table 2** Descriptive statistics

| **Continuous variables** | **Mean** | **Std. Dev.** | **Min** | **Q1** | **Median** | **Q3** | **Max** | **Firm-years** |
|---|---|---|---|---|---|---|---|---|
| *AC* | 0,27465 | 0,04382 | 0,10968 | 0,25512 | 0,27629 | 0,30053 | 0,44050 | 1.189 |
| *ABAFEE* | 0,01407 | 0,47116 | -1,88730 | -0,28757 | 0,03333 | 0,34359 | 1,57247 | 1.189 |
| *MANAGOWN* | 0,09233 | 0,23696 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,99550 | 1.189 |
| *BONUSRATIO* | 0,91009 | 0,95009 | -0,43750 | 0,26144 | 0,63716 | 1,22706 | 4,62963 | 1.189 |
| *GROWTH* | 0,09377 | 0,27556 | -0,83813 | -0,01946 | 0,06973 | 0,16546 | 4,14211 | 1.189 |
| *LNTA* | 12,68498 | 1,96079 | 8,69266 | 11,18985 | 12,30015 | 13,97695 | 17,39159 | 1.189 |
| *LEVERAGE* | 0,14154 | 0,17813 | 0,00000 | 0,00670 | 0,06779 | 0,21299 | 0,83224 | 1.189 |
| *ROA* | 0,04338 | 0,09101 | -1,02642 | 0,01760 | 0,04425 | 0,07721 | 0,33764 | 1.189 |

| **Indicator variables** | **Mean** | **Std. Dev.** | **0** | **1** | **Firm-years** |
|---|---|---|---|---|---|
| *INDSPEC* | 0,30950 | 0,46248 | 827 | 370 | 1.189 |
| *BIG5* | 0,74769 | 0,43452 | 302 | 895 | 1.189 |
| *AUDCOM* | 0,51640 | 0,49994 | 579 | 618 | 1.189 |
| *OPTION* | 0,39613 | 0,48930 | 723 | 474 | 1.189 |

**Notes:**
Table 2 presents the summary statistics of the main variables used in my analyses. All variables are defined in Appendix I.

**Table 3** Pearson and Spearman correlations among regression variables

| | *AC* | *ABAFEE* | *INDSPEC* | *BIG5* | *MANAG OWN* | *AUDCOM* | *BONUS RATIO* | *OPTION* | *GROWTH* | *LNTA* | *LEVE RAGE* | *ROA* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *AC* | **1,0000** | -0,0196 | -0,0520 | -0,0605 | -0,0141 | -0,0340 | -0,1654 | -0,0625 | -0,0146 | -0,0866 | -0,0667 | -0,2713 |
| | | (0.50) | (0.07) | (0.04) | (0.62) | (0.24) | (0.00) | (0.03) | (0.62) | (0.00) | (0.02) | (0.00) |
| *ABAFEE* | -0,0447 | **1,0000** | 0,1070 | -0,0556 | 0,0034 | 0,0464 | 0,0366 | 0,0683 | -0,0216 | -0,0208 | -0,0208 | 0,0003 |
| | (0.12) | | (0.00) | (0.06) | (0.91) | (0.11) | (0.21) | (0.02) | (0.46) | (0.47) | (0.47) | (0.99) |
| *INDSPEC* | -0,0724 | 0,1047 | **1,0000** | 0,2633 | -0,0723 | 0,2037 | 0,2172 | -0,0178 | -0,0127 | 0,3847 | 0,0283 | 0,0351 |
| | (0.01) | (0.00) | | (0.00) | (0.01) | (0.00) | (0.00) | (0.54) | (0.66) | (0.00) | (0.33) | (0.23) |
| *BIG5* | -0,0540 | -0,0437 | 0,2633 | **1,0000** | 0,0263 | 0,2787 | 0,1312 | 0,0865 | -0,0451 | 0,2703 | 0,0195 | -0,0342 |
| | (0.06) | (0.13) | (0.00) | | (0.37) | (0.00) | (0.00) | (0.00) | (0.12) | (0.00) | (0.50) | (0.24) |
| *MANAGOWN* | -0,0496 | -0,0215 | -0,0881 | 0,0279 | **1,0000** | 0,0427 | -0,0444 | 0,0645 | -0,0203 | 0,0549 | -0,0530 | -0,0424 |
| | (0.09) | (0.46) | (0.00) | (0.34) | | (0.14) | (0.13) | (0.03) | (0.49) | (0.06) | (0.07) | (0.14) |
| *AUDCOM* | -0,0119 | 0,0388 | 0,2037 | 0,2787 | -0,0002 | **1,0000** | 0,3238 | 0,1162 | -0,0350 | 0,5645 | 0,1192 | -0,0587 |
| | (0.68) | (0.18) | (0.00) | (0.00) | (0.99) | | (0.00) | (0.00) | (0.23) | (0.00) | (0.00) | (0.04) |
| *BONUSRATIO* | -0,1702 | 0,0058 | 0,2060 | 0,1432 | -0,0917 | 0,2759 | **1,0000** | 0,0854 | 0,2161 | 0,5046 | -0,0828 | 0,3341 |
| | (0.00) | (0.84) | (0.00) | (0.00) | (0.00) | (0.00) | | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| *OPTION* | -0,0796 | 0,0842 | -0,0178 | 0,0865 | -0,0071 | 0,1162 | 0,0517 | **1,0000** | 0,0924 | 0,0388 | -0,0427 | 0,0233 |
| | (0.01) | (0.00) | (0.54) | (0.00) | (0.81) | (0.00) | (0.07) | | (0.00) | (0.18) | (0.14) | (0.42) |
| *GROWTH* | 0,0123 | 0,0564 | -0,0376 | -0,0329 | -0,0694 | -0,0339 | 0,1361 | 0,1041 | **1,0000** | 0,0045 | -0,1069 | 0,3135 |
| | (0.67) | (0.05) | (0.20) | (0.26) | (0.02) | (0.24) | (0.00) | (0.00) | | (0.88) | (0.00) | (0.00) |
| *LNTA* | -0,0088 | -0,0209 | 0,4194 | 0,2805 | 0,0036 | 0,5490 | 0,4895 | 0,0402 | -0,0349 | **1,0000** | 0,1393 | -0,0311 |
| | (0.76) | (0.47) | (0.00) | (0.00) | (0.90) | (0.00) | (0.00) | (0.17) | (0.23) | | (0.00) | (0.28) |
| *LEVERAGE* | -0,0551 | -0,0765 | 0,0068 | -0,0046 | -0,0687 | 0,0769 | -0,1469 | -0,0303 | -0,0650 | 0,0029 | **1,0000** | -0,3513 |
| | (0.06) | (0.01) | (0.81) | (0.87) | (0.02) | (0.01) | (0.00) | (0.30) | (0.03) | (0.92) | | (0.00) |
| *ROA* | -0,3232 | 0,0074 | 0,0454 | -0,0349 | -0,0217 | -0,0506 | 0,2804 | 0,0163 | 0,1456 | 0,0313 | -0,2791 | **1,0000** |
| | (0.00) | (0.80) | (0.12) | (0.23) | (0.46) | (0.08) | (0.00) | (0.57) | (0.00) | (0.28) | (0.00) | |

**Notes:**
Table 3 presents the Pearson correlation coefficients below the diagonal and the Spearman correlation coefficients above the diagonal. Two-tailed p-values are presented in parentheses. All variables are defined in Appendix I.

**Table 4** Results of the association between external and internal corporate governance mechanisms and agency costs

| **Dependent variable** | *AC* | |
|---|---|---|
| **Variables** | **Coefficient** | **t-statistics** |
| *ABAFEE* | -0,00440 * | -1,76 |
| *INDSPEC* | -0,02104 *** | -2,65 |
| *BIG5* | -0,00650 ** | -2,07 |
| *INDSPEC*BIG5* | 0,01693 ** | 2,01 |
| *MANAGOWN* | -0,01435 *** | -2,83 |
| *AUDCOM* | 0,00118 | 0,42 |
| *BONUSRATIO* | -0,00781 *** | -5,21 |
| *OPTION* | -0,00732 *** | -2,98 |
| *GROWTH* | 0,01321 *** | 2,94 |
| *LNTA* | 0,00282 *** | 3,04 |
| *LEVERAGE* | -0,04272 *** | -6,13 |
| *ROA* | -0,16594 *** | 11,95 |
| **Firm Years** | 1.189 | |
| **Adj. $R^2$** | 0,1708 | |

**Notes:**
Table 4 presents the results of estimating tobit regression that includes fixed effects for fiscal year and industry. The regression is estimated with an intercept included (not tabulated). ***, **, and * denote p-value significance at the 1%, 5% and 10% levels, with two-tailed tests. I winsorized all cotinuous variables at the 1 %, and respectively, 99 % level to control for outliers. To assess the economic significance of the used independent variables, I estimate a regression using OLS (Tobit regressions do not have a goodness-of-fit measure analogous to adjusted R2). All variables are defined in Appendix I.

**Table 5** Results of the association between lagged external and internal corporate governance mechanisms and agency Costs

| **Dependent variable** | *AC* | |
|---|---|---|
| **Variables** | **Coefficient** | **t-statistics** |
| *LAGABAFEE* | -0,00620 ** | -2,56 |
| *LAGINDSPEC* | -0,01947 *** | -2,61 |
| *LAGBIG5* | -0,00552 * | -1,78 |
| *LAGINDSPEC*LAGBIG5* | 0,01671 ** | 2,10 |
| *LAGMANAGOWN* | -0,01372 *** | -2,60 |
| *LAGAUDCOM* | 0,00161 | 0,57 |
| *LAGBONUSRATIO* | -0,00883 *** | -6,23 |
| *LAGOPTION* | -0,00646 *** | -2,66 |
| *GROWTH* | 0,00962 ** | 2,16 |
| *LNTA* | 0,00277 *** | 3,04 |
| *LEVERAGE* | -0,04432 *** | -6,40 |
| *ROA* | -0,16771 *** | -12,36 |
| **Firm Years** | 1.189 | |
| **Adj. $R^2$** | 0,1785 | |

**Notes:**
Table 5 presents the results of estimating Tobit regression that includes fixed effects for fiscal year and industry. The regression is estimated with an intercept included (not tabulated). ***, **, and * denote p-value significance at the 1%, 5% and 10% levels, with two-tailed tests. I winsorize all continuous variables at the 1 %, and respectively, 99 % level to control for outliers. To assess the economic significance of the used independent variables, I estimate a regression using OLS (Tobit regressions do not have a goodness-of-fit measure analogous to adjusted R2). All variables are defined in Appendix I.

**Table 6** Results of the association between external and internal corporate governance mechanisms and agency costs using OLS-regression

| **Dependent variable** | *AC* | |
|---|---|---|
| **Variables** | **Coefficient** | **t-statistics** |
| *ABAFEE* | -0,00440 * | -1,74 |
| *INDSPEC* | -0,02104 *** | -2,62 |
| *BIG5* | -0,00650 ** | -2,05 |
| *INDSPEC*BIG5* | 0,01693 ** | 1,99 |
| *MANAGOWN* | -0,01435 *** | -2,80 |
| *AUDCOM* | 0,00118 | 0,41 |
| *BONUSRATIO* | -0,00781 *** | -5,15 |
| *OPTION* | -0,00732 *** | -2,94 |
| *GROWTH* | 0,01321 *** | 2,90 |
| *LNTA* | 0,00282 *** | 3,01 |
| *LEVERAGE* | -0,04272 *** | -6,06 |
| *ROA* | -0,16594 *** | -11,81 |
| **Firm Years** | 1.189 | |
| **Adj. $R^2$** | 0,1708 | |

**Notes:**
Table 6 presents the results of estimating OLS-regression that includes fixed effects for fiscal year and industry. The regression is estimated with an intercept included (not tabulated). ***, **, and * denote p-value significance at the 1%, 5% and 10% levels, with two-tailed tests. I winsorized all cotinuous variables at the 1 %, and respectively, 99 % level to control for outliers. All variables are defined in Appendix I.