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UN ANÁLISIS EMPÍRICO DEL IMPACTO DE LA REGULACIÓN CONTABLE EN EL MERCADO DE AUDITORÍA

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ACRÓNIMOS

2SLS	Two-Stage least squares
AC	audit committee
AS2	Auditing Standard No. 2
AS5	Auditing Standard No. 5
BAF	Big Auditing Firms
BD	Board of directors
BoD	Board of directors
CAGR	Compound annual growth rate
CEO	Chief Executive Officer
CG	Corporate governance
CNMV	Comisión Nacional del Mercado de Valores
CRG	Constant rate of growth
DM	Debilidad material
EE.UU.	Estados Unidos
EU	European Union
FAT	Funnel asymmetry test
Financial Act	Financial System Reform Act
GAAP	Generally accepted accounting principles
GAO	General Accounting Office
GLS	Generalized Least Square
IAASB	International Auditing and Assurance Standard Board
IFAC	International Federation of Accountants
IFRS	International Financial Reporting Standards
ISA	International Standard on Auditing
IT	Information technology
LSE	London Stock Exchange
MRA	Meta-regression analysis
NAS	Non-audit services

Nasdaq	National Association of Securities Dealers Automated Quotation
NIA	Norma internacional de auditoría
NIIF	Normas Internacionales de Información Financiera
NPGC	Nuevo Plan General Contable
NYSE	New York Stock Exchange
OLS	Ordinary least squares
PCAOB	Public Company Accounting Oversight Board
PGC	Plan General Contable
PET	Precision effect test
RMP	relative market power
SABI	Sistema de Análisis de Balances Ibéricos
SCP	Structure-conduct-performance
SEC	Securities and Exchange Commission
SOX	Ley Sabarnes-Oxley
SSRN	Social Science Research Network
US	United States
UK	United Kingdom
WLS	Weighted least squares
Wok	Web of Knowledge

CAPÍTULO 1. JUSTIFICACIÓN DE LA INVESTIGACIÓN

Nuestro interés por continuar y profundizar en el estudio de la estructura del mercado de la auditoría y en el impacto que la regulación contable puede tener sobre determinadas variables del mercado de auditoría, es el punto de inicio que da origen a esta investigación.

Durante la primera década de este siglo se han producido cambios sustanciales en la normativa contable, cuyo propósito principal ha sido permitir la convergencia de los estándares contables nacionales a la normativa internacional, con el objeto de mejorar e impulsar, a través de la información financiera, el funcionamiento y eficiencia de los mercados de capitales. Este proceso ha permitido el surgimiento de varias líneas de investigación, entre las que destacamos la que examina las repercusiones económicas en los honorarios de los servicios de auditoría (Diehl, 2010; Griffin et al., 2009; Kim et al., 2012).

Estos cambios en la regulación contable se inician con la publicación del Reglamento europeo 1606/2002, donde se requería que los grupos cotizados formulasen sus estados financieros consolidados desde el 1 de enero de 2005, conforme a las Normas Internacionales de Información Financiera o NIIF (en inglés, International Financial Reporting Standards, IFRS). No obstante, conviene mencionar que, para el resto de compañías y estados financieros, la norma otorgó una mayor libertad a los estados miembros a la hora de permitir o exigir su aplicación.

En el caso de España, cabe decir que, la opción por la que se optó para los estados financieros de las empresas individuales, fue continuar con la aplicación de la normativa contable española vigente. Con referencia a los grupos consolidados no cotizados, éstos pudieron elegir entre continuar aplicando la normativa contable nacional o adoptar voluntariamente las NIIF. Ciertamente, no fue hasta 2007, con la

aprobación del Nuevo Plan General Contable (NPGC) y del plan para pequeñas y medianas empresas (Real Decreto 1514/2007 y 1515/2007), con efectos a partir de enero de 2008, cuando, finalmente, se produjo la adaptación de las NIIF al resto de empresas, aunque con importantes divergencias entre ambas normativas contables (Gonzalo-Angulo, 2014).

El impacto que puede tener estos cambios en la normativa contable sobre la eficiencia de los mercados de capitales, el nivel de competencia del mercado de auditoría o la calidad de la información financiera es objeto de preocupación de los organismos reguladores. Así, la Unión Europea en su documento "Consulta pública sobre el impacto de las normas internacionales de información financiera en la Unión Europea"[1] (2014) solicita formalmente la realización de estudios que analicen la repercusión de la nueva normativa contable.

A su vez, otro objeto de preocupación de los organismos reguladores es el funcionamiento del mercado de auditoría. La elevada concentración del mercado en manos de las Grandes Firmas Auditoras, situación que se extiende a una gran cantidad de países, ha suscitado el temor de que el funcionamiento de este mercado deje de ser competitivo y genere deficiencias en la calidad, precios abusivos del servicio o barreras de entrada a las pequeñas y medianas firmas auditoras, entre otras cuestiones (Metcalf Report, 1977; GAO 2003, 2008; Comisión Europea, 2010; Competition Commission, 2013). De hecho, la reciente Regulación (EU) 537/2014, en la que el Parlamento Europeo solicita mantener una continua vigilancia sobre el mercado de auditoría, y más concretamente, en los riesgos derivados de su elevada concentración, es una muestra de la importancia que representa continuar profundizando en el estudio de este mercado, incidiendo en su estructura y el comportamiento de las firmas auditoras.

[1] http://ec.europa.eu/internal_market/consultations/2014/ifrs/docs/consultation-document_en.pdf

En España, la estructura del mercado de la auditoría se caracteriza, como en la mayoría de los países, por ser un mercado altamente concentrado en manos de las *Cuatro Grandes* (Carrera et al., 2005) presentando una estructura oligopolista (Ruiz-Barbadillo et al., 2016) y que, por tanto, es susceptible de seguir su evolución.

Este estudio pretende contribuir a las aportaciones de investigación solicitadas por la Unión Europea respecto al impacto de la nueva normativa contable (Consulta pública sobre el impacto de las normas internacionales de información financiera en la Unión Europea, 2014) así como a la evolución del mercado de auditoría (Regulación (EU) 537/2014).

En particular, el objetivo general de este proyecto de investigación es analizar el impacto económico del nuevo marco de información financiera sobre los honorarios de auditoría y sobre la rentabilidad de las firmas auditoras.

La evidencia empírica previa sobre 14 países europeos (Kim et al., 2012) confirma que la adopción de las NIIF ha supuesto un incremento en los honorarios de auditoría, pero este aumento no es uniforme, puesto que depende del resultado neto de dos fuerzas contrapuestas (el incremento en la complejidad y la mejora en la calidad de los estados financieros).

No obstante, en el caso de España, la aplicación de las Normas Internacionales de Información Financiera se ha caracterizado porque su implantación se ha realizado en dos etapas claramente diferenciadas y, por lo tanto, los efectos pertinentes a la política de precios de las firmas de auditoría son más difíciles de dictaminar, especialmente los correspondientes a la segunda fase, en 2008, cuando se amplió el radio de alcance al resto de empresas.

Esta circunstancia hace que cobre relevancia y nos incentive para profundizar en el estudio de la evolución de la política de precios de las firmas auditoras y, sobre todo, en el impacto de la adopción de la nueva normativa contable en un entorno

institucional como el español, caracterizado por unos estándares contables nacionales previos que diferían considerablemente de los internacionales (Gonzalo-Angulo, 2014), y en donde la implementación de la reforma contable se ha realizado en dos períodos consecutivos, 2005 y 2008.

Por otro lado, la evolución de los precios por otros servicios distintos a los de auditoría requiere una mayor investigación en esta área, debido a que se desconocen los efectos en los precios por consultoría derivados de la adopción de las NIIF. En principio, éstos estarán influidos por la interacción de dos fuerzas cuyo resultado es, a priori, desconocido. Por un lado, existiría un potencial incremento en la demanda de estos servicios (Estudio KPMG, 2010), pero, por otro, nos encontraríamos con la influencia de una reglamentación más restrictiva en cuanto a la provisión conjunta de estos servicios y los de auditoría por parte del misma firma auditora (SOX, 2002).

Además, se mantiene la cuestión de que, en caso de producirse una variación en precios por la adopción de las NIIF, ésta sea como resultado de un mayor coste soportado o, por el contrario, repercuta directamente en la rentabilidad de las firmas de auditoría. Para responder a esta pregunta correctamente es preciso enfocar esta cuestión examinando y valorando la estructura del mercado de la auditoría y su efecto sobre los resultados de las empresas.

Partiendo de los factores anteriores y, con el propósito de proporcionar evidencia que contribuya al mejor entendimiento del mercado de auditoría y al proceso de formación de precios en un entorno marcado por la implementación de nueva normativa contable, desarrollamos la presente tesis que discurre a través de tres objetivos diferenciados.

Nuestro primer objetivo consiste en la revisión de la literatura empírica previa con la que identificamos, en primer lugar, los elementos que conforman el modelo de honorarios, para, posteriormente, y mediante el empleo de técnicas meta-

analíticas, incidir en el análisis de aquellas variables que han despertado, en los últimos años, un mayor interés y preocupación entre los investigadores.

A partir del modelo de honorarios diseñado, planteamos nuestro segundo objetivo, el cual se centra en examinar cómo han evolucionado los precios, tanto por los servicios de auditoría como por los relativos a consultoría, durante las dos fases de implementación de las NIIF en España, con el objeto final de estimar la variación en los mismos resultante de la adopción de la normativa.

Finalmente, nuestro tercer y último objetivo valora nuevamente el impacto de la adopción de las NIIF en España, pero, en esta ocasión, bajo el marco de la teoría de la organización industrial y a través del análisis de la relación entre la estructura del mercado de la auditoría y la rentabilidad de las firmas auditoras.

Para alcanzar los anteriores objetivos, estructuramos este trabajo en las cinco siguientes partes, cuyo contenido y objetivos explicamos brevemente a continuación.

El capítulo segundo está dedicado al marco teórico y conceptual sobre el que se sustenta nuestro estudio empírico. En este apartado examinamos en detalle los componentes de la función de ingresos del auditor, lo que nos proporcionará las bases para identificar aquellos elementos de dicha función que, debido al interés que han suscitado en los últimos años, han recibido un mayor tratamiento por parte de la comunidad científica.

El tercer capítulo se centra en la revisión, mediante la aplicación de técnicas de metaanálisis, de aquellas variables seleccionadas a partir de nuestro marco teórico, y que hemos considerado que requieren un tratamiento más específico. Por lo tanto, a lo largo de este capítulo, recopilamos, cuantificamos y valoramos la literatura empírica previa, basada en la función de honorarios de Simunic (1980), con el propósito de ampliar los metaanálisis previos de Hay et al. (2006a) y Hay (2013) y estimar el tamaño del efecto de las variables anteriormente seleccionadas. Al mismo

tiempo, nuestros análisis nos proporcionarán evidencia empírica de las variables moderadoras del tamaño del efecto estimado, así como, en última estancia, también evaluaremos la existencia un sesgo de publicación que pudiera afectar a los resultados.

El capítulo cuarto estará dedicado a analizar la variación de los honorarios por servicios de auditoría y otros adicionales durante las dos fases de implementación de las NIIF en España, en 2005 y 2008. Para alcanzar dicho objetivo diseñaremos, en primer lugar, un modelo de precios que, tomando como ejercicio de referencia el año 2003, utilizaremos como base y de *expectativas*, lo que nos permitirá estimar los honorarios que se habrían aplicado si la nueva normativa contable no se hubiese llevado a cabo. La comparación entre valores reales y estimados nos proporcionará la potencial prima devengada en los honorarios (auditoría, servicios adicionales y totales).

El capítulo quinto, y tras recurrir al enfoque de la teoría de la organización industrial, lo dedicaremos a la revisión de la relación entre la estructura del mercado de auditoría y la rentabilidad de las firmas auditoras. A partir de la aplicación de los paradigmas estructura-conducta-resultado (en inglés, structure-conduct-performance o SCP) y poder de mercado relativo (en inglés, relative market power o RMP) buscamos explicar qué factor, ya sea el ratio de concentración o la cuota de mercado de cada empresa, es más relevante para explicar la relación estructura-rentabilidad. Bajo este marco, volveremos a analizar nuevamente el impacto de las NIIF con el objeto de discernir si, las variaciones en precios observadas en el capítulo cuarto, son consecuencia de un incremento en los costes soportados o si han derivado en mejoras en la rentabilidad de las firmas de auditoría.

Por último, en el capítulo sexto resumiremos las conclusiones alcanzadas, manifestando las limitaciones surgidas a lo largo de nuestro estudio empírico pero, también, enfatizando las futuras líneas de investigación que consideramos relevantes.

CAPÍTULO 2. ANÁLISIS DEL MERCADO DE AUDITORÍA: EL MODELO DE PRECIOS Y LA RENTABILIDAD DE LAS FIRMAS DE AUDITORÍA A TRAVÉS DE MECANISMOS DE DOMINIO DE MERCADO

2.1. Introducción

El propósito de este capítulo es fundamentar teóricamente el estudio del mercado de auditoría y el efecto de los cambios de la normativa contable en la estrategia de ingresos de los auditores. Para ello, en primer lugar, desarrollamos un modelo de precios que, sustentado en la evidencia empírica previa, nos permita identificar los principales componentes que determinan la remuneración del auditor. Este modelo será la base que utilizaremos para considerar cual habría sido la política de precios que se habría llevado a cabo en caso de que no se hubiese aplicado la reforma contable. En segundo lugar, extenderemos nuestro análisis teórico incluyendo la teoría tradicional de la Organización Industrial para examinar la forma en la que se estructura la relación entre el mercado y la rentabilidad obtenida por las firmas de auditoría.

2.2. La modelización de los honorarios del auditor

Nuestro trabajo de investigación, al igual que la mayoría de estudios que evalúan la estrategia de precios de las firmas de auditoría, toma como punto de partida el modelo económico propuesto por Simunic (1980), en el cual, los intereses que

surgen de la relación bilateral entre auditor y auditado, quedan recogidos en tres componentes:

a) El coste del auditor por el esfuerzo invertido en el proceso de auditoría.
b) Los recursos utilizados directamente por las empresas auditadas en su sistema contable, y el coste vinculado a los mismos.
c) Las posibles responsabilidades futuras que el auditor puede esperar por el ejercicio de su trabajo.

Bajo estos preceptos, y en un entorno de mercado competitivo, el objetivo de la entidad auditada va a ser minimizar los costes totales esperados por la revisión de su sistema de información financiera. El auditor, por su parte, trata de determinar el importe mínimo a percibir, de forma que equipare, para diferentes cantidades de recursos utilizados en el ejercicio de su actividad, el incremento de los costes totales esperados.

Por tanto, cuando el mercado es competitivo, el modelo de Simunic (1980) establece que:

$$pq = E(\hat{C}) = cq + E(\hat{d}|a,q)E(\hat{\theta})$$

Donde,

pq son los ingresos del auditor derivados del trabajo de auditoría u honorarios.

$E(\hat{C})$ es el coste total esperado.

c es el coste por unidad de factor empleado, incluyendo todos los costes de oportunidad. Incluye el margen de beneficios normal.

q es la cantidad de recursos que necesita el auditor para el desarrollo de su actividad.

$E(\bar{d}|a,q)$ es el valor presente de las futuras pérdidas que podrían originarse de los estados financieros auditados durante el ejercicio y está condicionado al sistema de información financiera del auditado (aq).

$E(\hat{\theta})$ es el porcentaje de participación del auditor en la responsabilidad frente a terceros por posibles pérdidas derivadas de defectos detectados en las cuentas anuales auditadas.

Como puede apreciarse, esta función vincula los ingresos del auditor a dos componentes, uno referido al coste de sus servicios (cq) y, el otro, a responsabilidades derivadas por reclamaciones frente a terceros $E(\bar{d}|a,q)\ E(\bar{\theta})$. Ambos componentes se verían afectados por el nivel de esfuerzo empleado ya que, a mayor esfuerzo, el componente de riesgo por responsabilidad se reduce pero, en cambio, se incrementa el coste de los servicios. Además, el modelo tiene en cuenta que el auditor debe utilizar la cantidad de recursos que necesita para reducir el riesgo de auditoría a un nivel aceptablemente bajo (IAASB, NIA 200)[2].

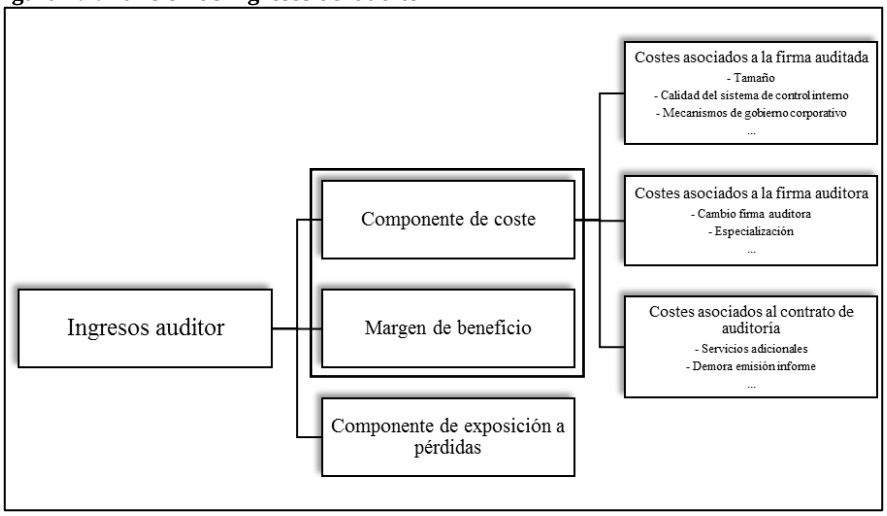
Por otro lado, también hay que tener en cuenta que la verificación externa del sistema contable, la auditoría, genera un output que difícilmente es medible y observable, tanto por la cantidad de recursos que se emplean como por el precio por unidad aplicado (Simunic, 1980). Los investigadores no suelen poder acceder a dicha información y es a través del output que sí es observable, los honorarios totales, el mejor reflejo de cómo las firmas de auditoría anticipan los costes esperados y el riesgo de litigio (Simunic y Stein, 1996).

A partir de este marco de referencia, la comunidad investigadora ha generado una prolífica línea de investigación, identificando y contrastando aquellas variables que forman parte de la función de ingresos del auditor, sin olvidar que su efecto puede variar según las condiciones institucionales de cada país.

[2] http://www.icac.meh.es/nias/nia%20200%20p%20def.pdf

A modo de resumen, la figura 2.1 representa la función de ingresos del auditor, desglosada entre el componente coste, que incluye el margen de beneficios, y el componente de exposición a pérdidas. El componente del coste se ha detallado tomando como base la clasificación de Hay (2006a).

Figura 2.1. Función de ingresos del auditor



No obstante, tal y como remarca Hay et al. (2006a), la literatura empírica sobre los determinantes de la función de ingresos de la auditoría, ha dado lugar a resultados en muchos casos contradictorios. En primer lugar, debido a la dificultad de medir convenientemente aquellas variables representativas de la función de producción del servicio de auditoría, pero también por aquellas que han sido excluidas del modelo o que presentan problemas de endogeneidad.

Hay et al. (2006a), en su metaanálisis, presenta una amplia revisión de 186 variables que agrupa en tres principales categorías: características de la empresa auditada, de la firma auditora y de los contratos de auditoría.

A continuación, partiendo de la clasificación establecida por Hay et al. (2006a), realizaremos un breve resumen de las principales variables empleadas por los investigadores, así como las implicaciones respecto a la política de precios del auditor.

2.2.1. Características asociadas a la firma auditada

Respecto a la naturaleza de la empresa auditada, son numerosas las variables con las que los investigadores han tratado de controlar diversos aspectos relevantes de sus costes, así como de medir su capacidad explicativa en el modelo de honorarios.

Las principales variables vinculadas al cliente son el tamaño de la firma auditada, la complejidad del servicio ofertado y el riesgo inherente a ciertas áreas en las que existe una mayor probabilidad de error durante la revisión, entre otras.

Sin duda alguna, entre las variables más utilizadas, destaca el tamaño de la empresa auditada, que se encuentra presente en casi todos los estudios. Según Hay et al. (2006a), explica más del 70% de la variación de los honorarios y se utiliza normalmente transformada mediante el logaritmo natural, lo que permite disponer de una distribución normal, así como de reducir la variabilidad y el sesgo (Mayhew y Wilkins, 2003; Menon y Williams, 2001; Palmrose, 1986b; Simon y Francis, 1988; Carson y Fargher, 2007, entre otros).

Aquellas áreas que tradicionalmente son más complejas de auditar, como, por ejemplo, el inventario y las cuentas por cobrar, suelen ser buenos subrogados del riesgo inherente que tiene que confrontar el auditor (Hay et al. 2006a) y, además, suelen ser subrogados del esfuerzo implícito (Charles et al., 2010; Choi et al., 2010).

Por último, la responsabilidad frente a terceros por pérdidas derivadas de defectos detectados en las cuentas anuales auditadas quedan normalmente recogidos, en la literatura de honorarios, en dos factores (Hay et al. 2006a):

(a) El riesgo de que el cliente presente pérdidas. El peor comportamiento económico del cliente es un factor que incrementa el riesgo del auditor a tener que soportar pérdidas a raíz de futuras denuncias legales. Normalmente se mide a través de la variable de rentabilidad económica (Ghosh y Pawlewicz, 2009; Huang et al., 2009) y una variable dicotómica que mide si la empresa presenta o no pérdidas (Carcello et al., 2002; Casterella et al., 2004; Carson et al., 2004).

(b) Otras variables utilizadas en la literatura que miden el riesgo financiero son el endeudamiento y el ratio de liquidez (O'Keefe et al., 1994; DeFond et al., 2000; Mayhew y Wilkins, 2003; Vermeer et al., 2009).

La introducción de mecanismos de supervisión interna, tales como la implantación de un sistema de control y/o de gobierno corporativo y sus efectos en la función de ingresos del auditor, han cobrado especial relevancia para la comunidad investigadora en los últimos años, por lo que merecen una consideración especial aparte.

2.2.1.1. Efectos del control interno de las empresas

Los costes vinculados a las empresas clientes influyen significativamente en la función de ingresos del auditor, respecto al esfuerzo y recursos destinados. No obstante, los procedimientos a ejecutar están determinados por la calidad del sistema de control interno y el grado de confianza del mismo, ya que puede influir en la estrategia del auditor (O'Keefe et al., 1994).

La fiabilidad del sistema de control interno de las empresas juega un papel relevante en la labor del auditor y el alcance de los procedimientos de la auditoría. Sin

embargo, la dificultad para acceder a la información interna de la compañía que permite valorar este apartado, ha dificultado su estimación.

Quizás debido a estas dificultades de medición, la evidencia empírica presenta resultados contradictorios. Por ejemplo, O'Keefe et al. (1994) no pudieron encontrar una conexión entre el grado de confianza del sistema de control interno y los honorarios. Por el contrario, Raghunandan y Rama (2006), localizaron primas de un 43% superior para aquellos clientes con debilidades materiales en su sistema de control interno.

Estas diferencias pueden estar motivadas por la influencia de una serie de factores como el marco regulador vigente o el contexto en que se lleve a cabo el estudio. En concreto, por ejemplo, con la incorporación de la Ley Sabarnes-Oxley (SOX) de 2002, se producen cambios relativos al sistema del control interno de las empresas y exige que el auditor evalúe la efectividad de dichos controles. Esta modificación en la normativa conlleva un cambio en la relación entre el esfuerzo del auditor y la auditoría interna, variación que queda posteriormente reflejada en los honorarios. Autores como Raghunandan y Rama (2006), Hogan y Wilkins (2008) y Hoitash et al. (2008), analizan este tema. Un resumen de los resultados obtenidos los encontramos en la tabla 2.1.

Tabla 2.1. Estudios empíricos sobre los efectos del control interno de las empresas en los honorarios

Autores (año)	País Periodo	Muestra	Variable	Principales conclusiones
O'Keefe et al. (1994)	EE.UU. (1989)	249 contratos	Grado de confianza en control interno	El grado de confianza del auditor sobre el sistema de control interno no ejerce efectos sobre el volumen de horas de trabajo ni en los honorarios.
Raghunandan y Rama (2006)	Compustat 2003 y 2004	660 empresas	Debilidad material	Honorarios superiores en un 43% para los clientes con DM en 2004. No significatividad en 2003. Resultados no sensibles al tipo de debilidad.
Goodwin-Stewart y Kent (2006)	Australia (2000)	401 empresas cotizadas	Auditoría Interna	Un mayor recurso de la auditoría interna se asocia con mayores honorarios (mayor demanda de auditorías de calidad superior).
Hoitash et al. (2008)	Compustat 2004 – 2005	2501 declarantes	Debilidad material Deficiencia significativa	Resultados sensibles a la intensidad de las deficiencias en control interno.
Hogan y Wilkins (2008)	Compustat 2003 – 2004	6735 empresas	Debilidad material Deficiencia significativa	Existencia de una prima adicional del 35% asociada a la existencia de deficiencias en el control interno.
Krishnan et al. (2008)	EE.UU. 2003-2005	55 empresas Información voluntaria coste SOX 404	Debilidad material	La presencia de debilidades materiales es uno de los factores de coste para el cumplimiento de SOX 404.
Hay et al. (2008)	Nueva Zelanda 1995 y 2005	130 y 83 empresas cotizadas	Auditoría Interna	Evidencia a favor del enfoque complementario entre mecanismos de control y auditoría externa.

Tabla 2.1. Estudios empíricos sobre los efectos del control interno de las empresas en los honorarios (continuación)

Autores (año)	País Periodo	Muestra	Variable	Principales conclusiones
Vermeer et al. (2009)	EE.UU. 2003	125 organizaciones grandes sin ánimo de lucro	Auditoría Interna	Mecanismos de control internos actúan de forma complementaria a los controles externos de auditoría.
Krishnan et al. (2011)	EE.UU. 2006 – 2008	1.563 empresas	Debilidad material	Prima satisfecha por emisión de informe con opinión desfavorable es inferior tras la implementación norma auditoría (AS5).
Munsif et al. (2011)	EE.UU. 2004 - 2007	1.610 SEC inscritos	Debilidad material	La prima asociada a debilidades en control interno persiste en años posteriores a su subsanación.
Abbott et al. (2012)	EE.UU. 2005	134 empresas	Debilidad material Grado de confianza en control interno	Asociación positiva y significativa entre la declaración de debilidades materiales en el sistema de control interno y honorarios.

2.2.1.2. Efectos de los mecanismos de Gobierno Corporativo de las empresas

Otros mecanismos internos de control, como la implantación de códigos de buenas prácticas destinados al gobierno corporativo de las entidades, también han suscitado, en los últimos años, un gran interés, tanto por sus implicaciones con respecto a la calidad de la información financiera como por su efecto sobre los servicios de auditoría.

Los mecanismos de gobierno corporativo engloban actuaciones como, por ejemplo, la creación de un comité de auditoría o la incorporación de directores externos en el consejo de administración. Es importante tener en cuenta que la actividad de los mismos puede ejercer un doble efecto sobre el ejercicio de la auditoría y, por lo tanto, en los honorarios del auditor.

Por un lado, y gracias a los mejores controles internos, el auditor precisa de un menor esfuerzo en el desarrollo de su labor, lo que favorece que se reduzca su tarifa. No obstante, por otro lado, otros autores han contrastado la existencia de un efecto complementario entre lo que se considera una buena gestión corporativa y los servicios externos de auditoría. Es decir, la existencia de estos mecanismos puede llevar aparejada un aumento en la demanda de estos servicios, lo que repercutiría en un consiguiente efecto positivo sobre los precios (Hay et al., 2008).

Para determinar qué perspectiva es la que domina la relación entre la disposición de buenas prácticas de gobierno corporativo y los servicios de auditoría externa, los investigadores han centrado sus esfuerzos en determinar qué papel representan la presencia de ciertas características recomendadas (tanto en el comité de auditoría como en la junta directiva) en los honorarios de los auditores.

Por ejemplo, Carcello et al. (2002) analizó la junta directiva incluyendo subrogados que le permitiesen valorar no solo la composición de la misma, sino

también su diligencia y experiencia. Sus resultados se encuentran en línea con otros autores que determinan que cuando las juntas son más independientes, diligentes y cuentan con expertos en las mismas, se tiende a reducir la potencial responsabilidad legal en la que pueden incurrir mediante la contratación de servicios de auditoría de mayor calidad (Hay et al., 2008; Bliss, 2011). Este incremento en costes tendría su reflejo en un aumento de los honorarios.

Sin embargo, otros autores no han encontrado resultados significativos cuando han analizado las mismas características (O'Sullivan, 1999). Estas diferencias también se extienden cuando el área de estudio es el comité de auditoría.

Estos resultados contradictorios tienden a evidenciar el incremento en la complejidad de la modelización de los mecanismos de gobiernos corporativo dentro de la función de ingresos de auditor.

La tabla 2.2 sintetiza los principales estudios empíricos sobre los efectos que, la implantación de mecanismos de gobierno corporativo, ejercen sobre los honorarios de auditoría.

Tabla 2.2. Estudios empíricos sobre los efectos de los mecanismos de Gobierno Corporativo de las empresas en los honorarios

Autores (año)	País Periodo	Muestra	Variable/s	Principales conclusiones
O'Sullivan (1999)	UK (1995)	146 empresas cotizadas más grandes	Junta Directiva (% directores no ejecutivos, nº directores externos...) y Comité de auditoría (nº de miembros, director ejecutivo).	Las mejoras en la composición de la Junta/Comité no afectan en los honorarios de la auditoría externa.
O'Sullivan (2000)	UK (1992)	402 empresas cotizadas	Junta Directiva (% directores no ejecutivos y dualidad gerente/presidente).	Una mayor independencia de la Junta se asocia con una mayor demanda de monitorización externa. No hay efecto generado por la dualidad CEO/presidente.
Goddard y Masters (2000)	UK (1994 y 1995)	233 y 223 medianas y pequeñas	Comité de auditoría (existencia del comité, cumplimiento requerimientos Código Cadbury).	Comité de auditoría pierde su relevancia en años posteriores.
Peel y Clatworthy (2001)	UK (1992)	132 empresas cotizadas	Junta Directiva (ratio directores no ejecutivos, dualidad gerente/presidente...).	Estrategia de precios del auditor no afectada por las características internas del gobierno corporativo.
Carcello et al. (2002)	EE.UU. (1992 – 1993)	258 empresas	Junta Directiva (% directores externos, nº de reuniones, nº directores sin cargo administrativo).	Juntas más independientes, diligentes y cualificadas demandan auditorías de mayor calidad.
O'Sullivan y Diacon (2002)	UK (1992)	117 compañías de seguro	Junta Directiva (dualidad CEO/presidente...) y Comité de auditoría.	En el mercado de seguros, los mecanismos de gobierno no influyen en la estrategia de precios del auditor.

Tabla 2.2. Estudios empíricos sobre los efectos de los mecanismos de Gobierno Corporativo de las empresas en los honorarios (continuación)

Autores (año)	País Periodo	Muestra	Variable/s	Principales conclusiones
Abbott et al. (2003)	EE.UU. (2001)	492 empresas auditadas por las 5 Grandes	Junta Directiva (% miembros externos, nº reuniones, solo independientes...) y Comité de auditoría (solo externos, competencia financiera, nº reuniones).	Relación positiva entre comité y honorarios.
Knechel y Willekens (2006)	Bélgica (2001)	50 compañías cotizadas	Junta Directiva (nº directores externos, % directores no ejecutivos y dualidad gerente/presidente…) y comité de auditoría (existencia del comité).	Enfoque complementario entre mecanismos de control interno y auditoría solo si voluntarios.
Hay et al. (2008)	Nueva Zelanda (1995 y 2005)	130 y 83 empresas cotizadas	Junta Directiva (nº directores externos, accionista mayoritario) y comité de auditoría (existencia del comité).	Mayor control interno favorece la demanda de mecanismos de control externo. Entornos no altamente regulados.
Krishnan y Visvanathan (2009)	EE.UU. (2000 – 2002)	500 empresas auditadas por las 5 Grandes	Junta Directiva (nº directores, % directores externos…) y comité de auditoría (nº reuniones, competencias…).	Solo el cumplimiento de experto financiero según SEC se percibe como mejora en la supervisión.
Bliss (2011)	Australia (2003)	799 compañías cotizadas	Junta Directiva (% directores externos, nº directores, dualidad CEO/presidente...)	Complementariedad independencia Junta y auditoría externa.

2.2.2. Características asociadas a la firma auditora

Los dos aspectos más relevantes referidos a este apartado y que repercuten en la estrategia de precios del auditor son, el cambio o sustitución de la firma auditora y la calidad del servicio de auditoría.

La inclusión en los modelos de auditoría de variables referidas al cambio del auditor proviene, principalmente, de la reducción de precios que suele aplicarse a los contratos iniciales, lo que en la práctica se describe como "lowballing". La aplicación de políticas de precio tipo "lowballing", implica fijar honorarios por debajo de los costes en los contratos iniciales y es una respuesta a las expectativas de recibir futuras cuasi-rentas derivadas de la reducción de costes en los siguientes períodos del contrato que permitirán compensar las pérdidas iniciales (DeAngelo, 1981).

No obstante, es la calidad de la auditoría la que ha recibido una mayor atención por parte de los investigadores, por lo que, a continuación, realizaremos un breve resumen de las principales aportaciones realizadas a través de uno de sus subrogados: la especialización del auditor.

2.2.2.1. Calidad del auditor. Especialización

La calidad de la auditoría se basa en dos pilares fundamentales: El conocimiento y la independencia. En relación al nivel de conocimiento del auditor, uno de los subrogados que se han utilizado normalmente para medir la calidad del servicio de auditoría es el nivel de especialización adquirido por la firma auditora. La especialización surge por la inversión que realiza la firma auditora con objeto de alcanzar los conocimientos, experiencia y habilidades específicas que precisan determinados sectores industriales, lo que le permite ofrecer unos servicios diferenciados respecto a otras firmas (Craswell et al., 1995).

No obstante, siguiendo el análisis que realiza Cullinan (1998) es difícil indicar el impacto que ocasiona dicha especialización en los honorarios del auditor, puesto que el resultado dependerá de una serie de condicionantes, es decir, que el mercado reconozca y valore dicha diferenciación y del efecto de la existencia de economías de escala o del enfoque que se utilice para fijar los precios (coste frente a mercado).

Otro problema surge con la cuantificación de este factor, que los investigadores han tratado de acotar a través de dos enfoques: la cuota de mercado y el alcance geográfico de la diferenciación de la firma auditora.

Respecto al primer enfoque, Palmrose (1986b) sugiere que la calidad de los servicios de auditoría está relacionada con el tamaño de la firma auditora y que los oferentes de un mejor servicio serán los que dispongan de una mayor cuota de mercado. Con respecto a este punto, son numerosos los trabajos que analizan la relación entre la cuota de mercado y la especialización del auditor. Así, en Australia, Craswell et al. (1995) constata que existe un retorno positivo del 34% que percibirían las 8 Grandes Firmas especializadas, cuando la especialización se alcanza con el 10% de la cuota de mercado. Sin embargo, tal y como indican, la definición de auditor especialista basada en el porcentaje de la cuota de mercado es arbitraria y los resultados pierden su relevancia cuando se aumentan los requisitos para alcanzar dicha categoría (cuota de mercado del 20%). Cabe señalar que otros autores utilizan, aislada o conjuntamente con el enfoque del alcance geográfico, el concepto de líder del sector industrial (DeFond et al., 2000; Ferguson y Stokes, 2002; Fields et al., 2004).

Con respecto al segundo enfoque, éste parte de la distinción de dos visiones alternativas: la primera, en la que el mercado reconoce y valora a la firma auditora de forma homogénea (normalmente a nivel nacional), y, la segunda, donde cada oficina (normalmente situadas en la misma ciudad que la sede del cliente) se percibe y se

valora individualmente, al ser el punto focal en la que los contratos de auditoría se gestionan y negocian. Esta diferenciación en la reputación percibida a diferentes niveles geográficos (ciudad, nacional…) es la que se ha plasmado en numerosos estudios (Ferguson et al., 2003; Francis et al., 2005; Basioudis y Francis, 2007; entre otros).

En la tabla 2.3 incluimos un breve resumen de las principales conclusiones alcanzadas respecto a las diversas conceptualizaciones empleadas por los autores en el campo de la especialización de la firma auditora.

Tabla 2.3. Estudios empíricos sobre los efectos de la especialización del auditor en los honorarios

Autores (año)	País Periodo	Muestra	Variable/s	Principales conclusiones
Palmrose (1986b)	EE.UU. (1980-1981)	361 empresas	Variable dicotómica (cuota mercado)	No hay evidencia de prima por especialización
Craswell et al. (1995)	Australia (1987)	1484 compañías cotizadas	Variable dicotómica (cuota mercado >=10%)	Prima por especialización de las 8 Grandes es del 34%
Ferguson y Stokes (2002)	Australia (1990,1992, 1994 y 1998)	1.174, 965, 1.069 y 1.084 empresas	Variable dicotómica (cuota mercado >=10%) Líder	Evidencia limitada para prima especialización industrial
Casterella et al. (2004)	EE.UU. (1993)	651 empresas	Variable dicotómica (cuota mercado)	Segmento pequeñas empresas, primas del 10%. Segmento grandes empresas, reducción del 7,6%
Francis et al. (2005)	EE.UU. (2000-2001)	3994 y 3.045 observaciones compañías cotizadas	Líder nacional no líder ciudad Líder ciudad no líder nacional Líder nacional y ciudad	Prima del 7,68% si especialización es a nivel ciudad y del 18,53% conjuntamente nacional y ciudad.
Ferguson et al. (2006)	Australia (1998)	681 cotizadas Ferguson et al. (2003)	Líder nacional 1º o 2º Líder industria en ciudad Otras clasificaciones	Resultados sensibles a la categoría de líder

Tabla 2.3. Estudios empíricos sobre los efectos de la especialización del auditor en los honorarios (continuación)

Autores (año)	País Periodo	Muestra	Variable/s	Principales conclusiones
Basioudis y Francis (2007)	UK (2002 - 2003)	506 compañías cotizadas	Líder (nacional, ciudad…)	Diferencias entre países respecto a la conceptualización de liderazgo.
Lowensohn et al. (2007)	EE.UU. (2003)	241 administraciones locales	Cuota mercado (log natural ingresos) Log natural nº total clientes Log natural nº medio clientes	No relación entre especialización y honorarios.
Carson (2009)	62 y 60 países (2000 y 2004)	8223 y 9223 compañías	Global 1º o 2º y/no nacional 1º nacional 1º no global 1º o 2º	Especialización a nivel global genera elevadas primas. Independiente de especialización a nivel nacional.
Cahan et al. (2011)	Compustat (2003-2007)	9565 observaciones	Variable dicotómica (cuota mercado >=30%)	Estrategia de precios y calidad varía según segmento mercado.
Hay y Jeter (2011)	Nueva Zelanda (2003)	222 empresas	Líder nacional y ciudad 1º Líder nacional, no ciudad 1º Líder ciudad, no nacional 1º	Prima especialización a nivel ciudad, no nacional.
Zerni (2012)	Suiza (2003-2007)	862 compañías cotizadas	Variable dicotómica (auditor 1º o 2º en sector y mín. 5 clientes en sector) Variable dicotómica (mín. dos clientes cotizados)	Conexión especialización del auditor con estrategia de precios a nivel de socio.
Fung et al. (2012)	EE.UU. (2000-2007)	17207 empresas cotizadas	Variable dicotómica (líder ciudad)	Beneficios por economías de escala solo para clientes de auditores especializados o con mayor poder de negociación.

2.2.3. Características asociadas a los contratos de auditoría

Tal y como especifica Hay et al. (2006a), las características asociadas a los contratos de auditoría engloban tanto la demora en la fecha de implementación del informe (Griffin et al., 2009), indicativo de mayor complejidad o de aparición de problemas durante el transcurso de los trabajos de auditoría, como también otros aspectos relevantes, como la emisión de informes con salvedades o con dudas sobre la continuidad del cliente (Raghunandan et al., 2006; Hay et al., 2006b; Dao et al., 2012) o sobre los servicios adicionales prestados por el auditor (Palmrose, 1986a; Whisenant et al.,2003; Krishnan and Yu, 2011).

La importancia de este último factor en términos de independencia de las firmas de auditoría y del flujo de conocimientos que surge de la implementación conjunta de ambos tipos de servicios, ha contribuido a desarrollar una línea propia de investigación orientada a investigar los efectos generados por los servicios adicionales prestados por el auditor.

2.2.3.1. Servicios adicionales

En la tabla 2.4 detallamos los principales artículos referidos a esta línea de investigación.

Al respecto, es importante destacar que, en los primeros estudios relativos a esta área, la estimación de la magnitud del efecto de esta variable, se realizaba principalmente mediante el empleo de una regresión lineal (OLS), por lo que el efecto se cuantificaba de forma unidireccional, es decir, considerando que la influencia se producía únicamente desde los servicios adicionales a los de auditoría. En este sentido, Palmrose (1986a) obtiene para el mercado estadounidense, evidencia de una relación positiva entre los honorarios por servicios de auditoría y los servicios

adicionales, desglosados estos últimos en tres categorías (contabilidad, fiscalidad y otros). En cambio, los resultados de O'Keefe et al. (1994) mostraban que la provisión conjunta de ambos servicios no proporcionaba resultados significativos ni tampoco afecta al nivel de horas de auditoría empleadas en ninguna de las categorías del personal examinado.

Es a partir del 2003 cuando surgen, aunque con resultados heterogéneos, trabajos en los que el flujo de información y conocimientos se considera en ambas direcciones (Whisenant et al., 2003; Hay et al., 2006b; Antle et al., 2006). En concreto, Whisenant et al. (2003) aplicando un sistema de ecuaciones simultáneas confirman que los honorarios por ambos tipos de servicios se encuentran simultáneamente determinados y, en contra de la evidencia empírica previa, no detectan que exista una asociación entre ambos. Sin embargo, otros autores como Antle et al. (2006), utilizando también ecuaciones simultáneas, proporcionan evidencia consistente de influencia entre ambas variables.

Tabla 2.4. Estudios empíricos sobre el efecto de los servicios adicionales en los honorarios

Autores (año)	País Periodo	Muestra	Variable/s	Principales conclusiones
Simunic (1984)	EE.UU. (1977)	130 compañías pequeñas 133 compañías grandes	Ratio (Honorarios por servicios adicionales/Activo total)	La adquisición de servicios consultivos se asocia con un incremento en los honorarios de auditoría.
Palmrose (1986a)	EE.UU. (1980-1981)	298 empresas cotizadas	Log natural servicios adicionales	Consistente con los resultados obtenidos por Simunic (1984).
Davis et al. (1993)	EE.UU. (N/A)	98 empresas	Honorarios por servicios adicionales	La transferencia de conocimientos no genera ni eficiencias en la función de producción ni beneficios traspasados a los clientes.
O'Keefe et al. (1994)	EE.UU. (1989)	249 contratos auditoría	Ratio (Honorarios por servicios de consultoría fiscal o dirección/Honorarios auditoría)	No hay efecto por la provisión de servicios de consultoría en el nº horas destinadas a auditoría.
Firth (1997)	Noruega (1991 y 1992)	157 compañías cotizadas	Log. natural honorarios asesoría	Resultados en la misma línea que Simunic (1984) y Palmrose (1986a).
Houghton y Jubb (1999)	Australia (1987 y 1988)	270 compañías	Log. natural honorarios por servicios adicionales	Vinculación entre emisión opinión de auditoría con salvedades y mayor nivel de honorarios por servicios de auditoría y adicionales durante dos ejercicios.

Tabla 2.4. Estudios empíricos sobre el efecto de los servicios adicionales en los honorarios (continuación)

Autores (año)	País Periodo	Muestra	Variable/s	Principales conclusiones
Ezzamel et al. (2002)	UK (1995)	193 compañías cotizadas	∑ honorarios por servicios adicionales por auditor titular ∑ honorarios por servicios adicionales por otros auditores	Clasificación servicios adicionales según auditor (titular versus otros). La relación entre honorarios por servicios auditoría y adicionales varía en función de la tipología.
Whisenant et al. (2003)	EE.UU. (2001)	2666 observaciones	Log. natural honorarios por servicios adicionales	Aplicación OLS y 2SLS. Con la aplicación de sistema de ecuaciones simultáneas, los resultados pierden significatividad.
Hay et al. (2006b)	Nueva Zelanda (1999, 2000 y 2001)	177, 224 y 243 empresas	Log. natural honorarios por servicios adicionales	Aplicación OLS y 2SLS. Los honorarios por auditoría y servicios adicionales están conjuntamente determinados.
Antle et al. (2006)	UK (1994-2000) EE.UU. (2000)	2294 observaciones y 1570 observaciones	Log. natural honorarios por servicios adicionales	Aplicación OLS y 2SLS. Relación positiva y significativa entre ambos servicios.
Stein (2006)	EE.UU. (2001)	3053 empresas cotizadas	Log. natural honorarios por servicios adicionales	Aplicación OLS y 2SLS. Asociación positiva entre ambos servicios.
De Fuentes y Pucheta-Martínez (2009)	España (2002)	135 empresas	Log. natural honorarios por servicios adicionales	Aplicación OLS y 2SLS. No efectos por transferencia de conocimientos entre servicios adicionales y de auditoria.

2.3. La relación entre la estructura de mercado y la rentabilidad de las firmas auditoras

La estructura del mercado de auditoría, su nivel de competencia y funcionamiento, ejerce una considerable influencia en el proceso de formación de precios de las empresas oferentes de este servicio, lo que nos lleva a la consideración de técnicas de organización industrial que nos permitan valorar su peso en la determinación de la rentabilidad de las firmas auditoras.

La organización industrial es la rama de conocimiento dentro de la microeconómica que analiza la estructura y funcionamiento de los mercados así como el comportamiento de las empresas que interactúan en ellos, con el objeto de alcanzar un entendimiento de los procesos que suceden en los mismos y las implicaciones asociadas la implementación de políticas públicas (Schmalensee, 1989).

En los inicios de la literatura empírica de la organización industrial destacan las contribuciones realizadas a partir de los desarrollos y debates de dos corrientes, la escuela de Chicago-UCLA versus la escuela de Harvard o estructuralista. Las diferencias entre ambas vertientes estriban principalmente en la relación de causalidad asociada entre la concentración del mercado y los resultados/eficiencia de las empresas que en él actúan.

La escuela de Harvard o estructuralista, se caracteriza por decantarse por modelos de oligopolio, da prioridad a la estructura del mercado y establece una relación causa-efecto entre esta variable como determinante del comportamiento de las empresas que, a su vez, determina el resultado. Dentro de los máximos exponentes de la vertiente estructuralista nos encontramos las aportaciones de Mason (1939) y Bain (1951, 1956).

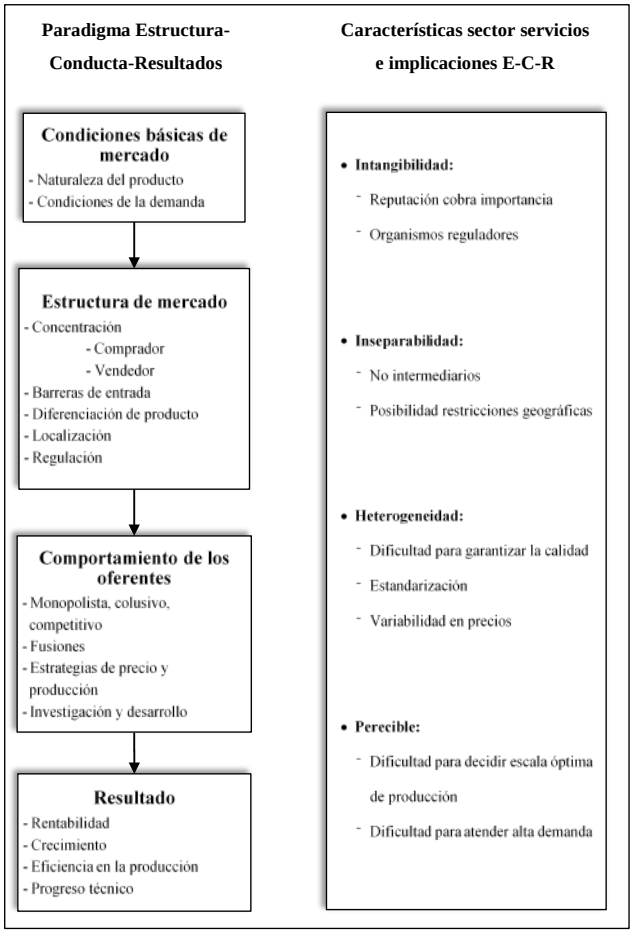
Por el contrario, las tesis de la escuela de Chicago-UCLA establecen una relación inversa, donde las características económicas de las empresas son las que determinan el comportamiento de los oferentes del mercado y, es a partir de este elemento, el determinante de la estructura del mercado. En Shepherd (1990b) podemos encontrar una amplia revisión de enfoques alternativos a la escuela estructuralista.

Con el propósito de analizar el comportamiento de las empresas que conforman nuestro mercado objeto de estudio nos decantamos por la corriente estructuralista. Aunque tradicionalmente este enfoque se ha empleado en estudios de corte industrial, también ha tenido una amplia aplicación en el sector servicios, principalmente en el bancario (Berger, 1995; Tregenna, 2009; Mirzaei et al., 2013).

Por tanto, nuestro trabajo gira en torno a los desarrollos de la corriente estructuralista, en concreto, la metodología desarrollada en torno al paradigma Estructura-Conducta-Resultados (SCP) que se inició con el trabajo de Bain (1951) y posteriormente fue desarrollada en Bain (1956).

Sirva la figura 2.2 como síntesis de la secuencia y elementos que describen el paradigma y sus implicaciones en el sector servicios.

Figura 2.2. Paradigma Estructura-Conducta-Resultados en el sector servicios



Fuente: Britton et al. (1992)

Tal y como aparece en la figura 2.2, la representación tradicional del paradigma estructura-conducta-resultado expone que existe una relación unidireccional que parte de la estructura de mercado hacia el comportamiento de las empresas y, finalmente, a su vez, influye en los resultados de las mismas. Al respecto,

Britton et al. (1992) resalta las condiciones básicas del mercado, indicando que las particulares propiedades que corresponden a los servicios (intangibilidad, inseparabilidad, heterogeneidad y perecederos) hace necesario tener en cuenta esos elementos cuando se desea aplicar este paradigma en el sector servicios. En concreto, respecto al sector de la auditoría, la característica de intangibilidad, que recoge que los clientes no pueden "probar" el producto antes de adquirirlo, genera que otros factores, como la reputación o los organismos reguladores, cobren mayor importancia para la ejecución de la decisión de compra.

Por lo tanto, para adaptar correctamente un modelo de organización industrial, en concreto, el paradigma estructura-conducta-resultado debemos valorar las características especiales que abarcan los servicios de auditoría e incluir variables que sean representativas de los mismos.

Una vez concluido el desarrollo de nuestro marco teórico consideramos que existen determinados elementos, relativos al modelo de formación de precios, que en los últimos años, han suscitado un mayor interés dentro de la comunidad investigadora, por lo que dedicamos el siguiente capítulo a su análisis mediante la aplicación de técnicas meta-analíticas.

CAPÍTULO 3. INFLUENCE OF AUDITOR INDUSTRY SPECIALIZATION, NON-AUDIT SERVICES, INTERNAL CONTROL AND CORPORATE GOVERNANCE ON AUDIT FEES: FURTHER EVIDENCE ON META-ANALYSIS

3.1. Introduction

From the seminal work of Simunic (1980), a prolific stream of research has been developed with the aim of specifying the audit fee model and, ultimately, identifying the influence of several model components and regulatory changes on the auditor's bill.

Those efforts have also been fostered by regulatory bodies, that seem to have never-ending worries about the "excessive" and increasing concentration of the audit market in the hands of the successive 8/6/5/4 Big Auditing Firms (hereinafter BAF) and its consequences on the audit prices. Some examples are represented by GAO 2003 and 2008 or the Green Paper of the European Commission in 2010 that submits, to the public debate, the appointment, remuneration and duration of the audit engagement to a third party, rather than to the current contractual agents (a critical analysis of the Green Paper is offered by Humphrey et al. 2011).

Under the structure-conduct-performance paradigm, one of the predictive results of the increasing concentration of the audit firms was the increase in market power that could alter the fees of the audit services away from competitive pricing. However, as Abidin et al. (2010) point out, the increased concentration, when combined with cost efficiencies, does not necessarily lead to higher prices and then, more efficient firms should grow faster than less efficient firms resulting in a more concentrated industry structure. So, both prices (performance) and concentration

(structure) can be endogenously determined. Moreover, regulators must also rely on empirical evidence due to the difficulties in constructing a theoretical model that could predict audit market behavior (Pepall et al., 2008, ch. 16).

In fact, the conclusions about the level of competition in several audit markets are diverse: Meanwhile it seems that competitiveness is out of danger for all domestic UK companies listed on the London Stock Exchange, (Abidin et al., 2010) or for public companies in the US (GAO, 2008); the evidence provided by Carson et al. (2012) for the Australian publicly listed companies is that BAF *premium* has increased as the number of international players has decreased over the years from 6 to 4, with the largest global clients being the group which is paying higher audit bills.

Due to the relevance of this topic, the objective of this work is to classify, analyze, quantify and evaluate the great bulk of results related to audit fees, through descriptive and meta-analysis techniques, with the final goal of clarifying and providing a systematic review that would help in future research.

This paper builds on two previous papers by Hay et al. (2006a) and Hay (2013). The main contributions of this study are the following: In first place, regarding the period of time, this paper updates and extends both studies comprising also an additional period between 2007 and mid-2012, when many interesting studies have been published. Secondly, instead of Hay's approach based on addressing a wide range of topics (186 and 53 independent variables analyzed in Hay et al. 2006a and Hay 2013, respectively), we provide a deeper-dive into those that seem to be of greater concern among researchers during the last years, i.e. the provision of non-audit services (hereinafter NAS), the auditor's specialization, internal control weaknesses and the implementation of good corporate governance (CG) mechanisms. Additionally, we focus more on identifying moderators that would explain some of the heterogeneous results than on measuring overall effect size.

From the methodological perspective, we provide further exploration of the possible overestimation of the influence of some variables on the audit fees reported in prior studies (Hay et al., 2006a and Hay, 2013) with the purpose of overcoming traditional meta-analysis criticisms associated to the publication bias problem. To that end we have carried out not only the estimation of the Fail Safe N but also, recently recommended techniques (Stanley et al., 2008) such as a meta- regression model.

Our study comprises the revision of 103 studies being the great majority of them published along the 2000-mid 2012 period, although we have also considered some prior papers in order to get more robust results when analyzing certain questions.

Our data related to the specialization of the audit firm corroborate prior meta-analysis results, so it seems that, generally speaking, the higher the inferred knowledge of the auditor on a specific industrial sector, the higher the audit fees. However, the hypothesis of homogeneity was consistently refused so we explored different moderator variables: Our results reveal that the different proxies of auditor's specialization, i.e., its market share, city leadership, national leadership and both (city-national leadership), are good moderator variables. Additionally, we have also corroborated that the influence of hard auditor's regulation (SOX, 2002) is positively associated to audit fees and that the specialization premium is sensitive to client size since it can only be observed in the lower size market segment.

We also explored the influence of non-audit services on audit fees and they are positively related irrespective of the country in which the audit market has been analyzed or the consideration of endogeneity, but not when we control for endogeneity. The results calculated for the US show low consistency, when endogeneity is taken into account.

The influence of internal audit has evolved from being no significant (Hay et al., 2006a) to being positively significant Hay (2013). In both papers the quality of internal audit has been identified through different measures such as internal audit

expenditures, internal audit assistance, or the ratio of internal audit to total assets. Therefore, the positive sign revealed statistically in later papers supports the complementary argument, i.e. when a company needs to improve its financial information, would rather invest in both internal and external audit controls (Hay et al., 2008). Notwithstanding that, our period of study (2002-2012) allowed us to explore the lack of quality of the internal controls through the reported weaknesses in the internal control system. The overall results provided by the meta-analysis show that weaker internal control systems are associated with higher auditor effort and wider auditing tests, which result in higher audit fees. The results related to our moderator variables show that stricter regulation, in particular the post AS2 period, has increased the influence of the internal control deficiencies over the auditor fees. Regarding location, the positive pattern is observed no matter which environment is analyzed, although it seems that the divergence of regulations outside US triggers greater audit fees.

Regarding CG matters, we conclude that the variable "US location", associated to a hard law environment and strong stakeholder protection, represents a good moderator of the results published and collected in this study.

The results are robust to different statistical tests that address the File Drawer problem. We find a publication selection bias only in the field of auditor specialization, but there is a genuine effect of the different measures of auditor specialization on audit fees, after removing publication bias.

Our conclusions are especially relevant not only for those researchers who are getting into the audit market area of research, but also for those that are already in it but would benefit from a structured and systematic review of the published results. In our view, our outcomes can help to understand the different results revealed in the empirical works, and also provide solid foundations for future hypothesis developments. Additionally, the aim of this work is to make the identification and

measurement of variables that could be included in the audit fee models easier, and hopefully, enhance the robustness, reliability and representativeness of the results.

From our point of view the content of this work is also relevant for regulatory bodies, always watchful and attentive of the audit market´s functioning, since it explains some of the contradictory results that attempt to identify whether audit independence is threatened when audit and additional services are provided by the same firm.

The remainder of this article is developed under the following structure: In the next section, an overview of the literature is related, in which we have identified the possible moderating variables that may influence the audit fee model results obtained in different publications. Section 3.3 is devoted to explaining both the meta-analysis technique applied and the sample analyzed in this work. Section 3.4 explains the results obtained and the analysis of the moderating variables and the final section being dedicated to presenting the conclusions derived from our results.

3.2. Literature review and research questions

Most of the archival literature tests an audit fee model stemming from the seminal study of Simunic (1980). According to Seetharaman et al. (2002) or Kim et al. (2012) the audit fee model tested in the empirical literature follows this structure:

$$E(C) = cq + E(d)\,E(p)$$

Where:

E(C) is the total expected cost that equals total auditor income

C is the unit cost of the auditing, including opportunity costs and the normal profit margin

q is the quantity of resources used by the auditor when executing an audit, and includes the number of estimated hours

E(d) is the present value of possible future losses that may arise due to the financial statements audited in this year

E(p) is the probability of the auditor paying for the future losses associated to the audit of the financial statements in this year

Therefore, the income function is composed of a component that refers to the cost of the audit, *cq* that would increase with relation to the level of audit effort and a risk component of losses, *E(d) E(p)* that would decrease with the increase of auditor effort $E(d)= f(cq)$

However, since the terms of the audit engagement and the working papers are not public, the resources employed in a certain engagement (labeled *q*) are difficult to estimate, and so is the production function of the auditing service. Therefore, identifying the strategy of quality and price by different suppliers is a difficult task (Simunic and Stein, 1996).

A considerable number of studies have focused on determining and assessing the most relevant variables that may have an impact on the level of audit fees. Among them, as stated in the introduction, we have covered those which seem to be of higher attention during the last years, in particular, we will review the main contributions to the auditor's specialization, the joint provision of audit and non-audit services, the corporate governance mechanisms and internal control, all of them being key aspects contemplated in this study.

3.2.1. Auditor's industry specialization

The quality of audit services has always been one of the most frequent goals of audit research, especially whenever a financial scandal arises and it casts a shadow

on the auditor's role. Audit quality is based on two basic pillars, namely knowledge and independence.

An important surrogate of auditor's knowledge is the degree of specialization acquired, since many industrial sectors encompass specific accounting, taxes, commercial and environmental regulation. Therefore, it can be inferred that specialization increases an auditor´s reputation and that knowledge investment serves to generate positive returns on investment. However, it is difficult to predict the sign and magnitude of the impact of the auditor's specialization on the audit fees, since economies of scale, cost *vs* market based prices or the degree of differentiation perceived by the market might result in opposite effects on the audit fees (Cullinan, 1998 offers a structured description of specialization/audit fees behavior).

Researchers also have to overcome the obstacle of measuring the attribute of specialization, since they hardly have access to internal/proprietary information allowing the use of more precise inputs into the research. Two aspects regarding the identification of the *specialized* audit firm have been contemplated in the literature: The market share and the geographical scope of the audit firms.

Regarding the first question, under the assumption of market competition, in the long term the biggest market share in a certain industry should be attributable to the best service producer. Therefore, research has commonly identified the specialist auditors as those which are supervising the largest portion of a certain industry's turnover. To that end, they have used the following proxies, either isolated or combined (Hay et al., 2006a): A dichotomous variable that identifies the audit firm leading the industrial sector or/and those audit firms whose market share is above a specific level (for instance, 10% or 20%). Among those combinations, one example is represented by DeFond et al. (2000) that identified a specialized auditing firm when pertaining to the group of the BAF and additionally, its market share was within the three dominant auditors in the industrial sector. The findings of Mayhew and Wilkins (2003) in US show that audit firms only get a fee premium when they are not only

specialized (above 20 % of the total market share of an industrial sector) but are also differentiated from the remaining players (considering such types as firms that lead the market with differences of or greater than 10% of the remaining specialized auditors). In other words, auditors are able to charge a fee premium related to specialization, provided that the strategy of industry specialization is clearly signaled to and perceived by the audit market.

Therefore, the results could be conditioned by the different measures/approaches applied. A good example is offered in Craswell et al. (1995) since they identified a positive association if an auditor was labeled as *specialized* when its audit turnover was above 10% of the whole audit revenues generated in the industrial sector. However, when applying a more restrictive identification (20% of the market share), and the number of specialized auditors was reduced, the variable turned out not to be significant.

Additionally, during recent years, the geographical scope of the audit firm's specialization has also been under attention: The traditional approach presented above is founded on the basis that the market, at the national level, perceives the audit firm's industry specialization. Under this assumption, the firm as a whole offers the strategy of industrial differentiation. The alternative approach initiated at the beginning of this century, states that each geographical region/state within a country has its own market dynamic since customers can perceive the audit quality differentiation given by the service suppliers in a limited area of influence. Therefore, each audit firm's office constitutes a unique unit of analysis, that is usually located near the customer head office and where the *face to face* negotiations, the audit engagement, most of the audit execution or the audit reports take place. Therefore, the scope of influence (national/regional/city levels) has also been adopted as an alternative approach to auditor's specialization.

Ferguson et al. (2003) tested the presence of the specialization premium at the city/office level. Their results corroborated the city-level approach to industry specialization.

This alternative approach has been applied in following studies by different authors and environments, but their results are far from being conclusive. For instance, the investigation carried out by Francis et al. (2005) in the US market showed a statistically significant specialization fee premium only charged when the audit firm is the leader at both national and city levels. In contrast, Pong and Burnett (2006) analyzed the concentration of the audit market after the PricewaterhouseCoopers merger, and they failed to prove the presence of a specialization premium disregarding the geographic area employed. Hay and Jeter (2011), based on the New Zealand market, identified a specialization premium only at the city/office level, but not for a national level.

Zerni, M. (2012) in the Swedish audit market investigated a lesser unit of analysis, i.e. the reputation of the engagement partner. The empirical findings suggest that specialization is acknowledged and valuated by the users of financial statements, which triggers higher audit fees, but an essential part of the expertise and knowledge of the audit firm partners is not transferable across offices, since they are inherent to their individual characteristics.

An additional variable to be considered when reviewing the archival literature is the market segment where the specialization premium has been identified: Casterella et al. (2004) found that the Big Firms considered specialized charge an average fee premium of 10% but only to the small companies segment, those clients with assets less than $123m. On the contrary, bigger auditees located in the upper half sample (assets > $123m) did not pay a premium but, rather, audit fees decreased up to 7,6% due to their bargaining power. Nevertheless, Carson and Fargher (2007) in Australia found that the premium for this concept is focused on the largest clients.

Finally, the influence of audit regulation might also have an impact in the results provided by researches: Huang et al. (2007) replicate the Casterella et al. (2004) analysis, but compare the period before and after the enactment of Sarbannes-Oxley (SOX), 2000/2001 against 2003/2004. As for the pre-SOX period, the results support the findings of Casterella et al. (2004), but not for the years after, where they show a negative association with audit fees for all clients segments.

To sum up, results provided in the literature about the presence, in case, of a specialization premium are decidedly mixed: Within the group of 39 published studies, 19 show empirical evidence of the presence of a specialization fee premium[3], 17 studies failed to find any statistically significance[4], 2 results were significant but under certain conditions (Ferguson and Stokes; 2002 and Huang et al., 2007) and, finally, one paper reported a significant but negative association between the degree of auditor's specialization and the audit fees (Giroux and Jones, 2007).

Those somewhat contradictory or inconclusive results may rather be conditioned by the strong influence of potential moderating factors: (a) identification of the specialized audit firm (b) client size and (c) regulatory changes. The effects of those moderating factors on the specialization fee premium will be further analyzed through the meta-analysis technique in the results section (see Section 3.4.1).

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[3] Craswell et al. (1995), Cullinan (1998), DeFond et al. (2000), Casterella et al. (2004), Francis et al. (2005), McMeeking et al. (2006), Carson and Fargher (2007), Khalil et al. (2008), Carson (2009), Gul and Goodwin (2010), Choi et al. (2010), Cahan et al. (2011), Messier et al. (2011), Numan and Willekens (2012), Zerni (2012), Fung et al. (2012).

[4] Palmrose (1986b), Mayhew and Wilkins (2003), Ferguson et al. (2003), Fields et al. (2004), Boon et al. (2005), Jensen and Payne (2005), Basioudis and Ellwood (2005a), Chi (2006), Pong and Burnett (2006), Ferguson et al. (2006), Basioudis and Francis (2007), Lowensohn et al. (2007), Hay and Jeter (2011), Taylor (2011).

3.2.2. Non-audit services

Over the last three decades, two topics related to the joint provision of audit and non-audit services (NAS) by the same audit firm have been widespread analyzed in the literature, i.e. the economies of knowledge generated by the provision of both services and the impairment of the auditor`s independence.

The seminal work of Simunic (1984) showed that audit quality may benefit from the economies of knowledge that arises from the additional services (financial, tax, management accounting system, or computing system advice, among others). The positive linear relationship between audit and consultancy services was corroborated in the North American (Simunic, 1984), Norwegian (Firth, 1997), Australian (Houghton and Jubb, 1999), British (Beattie et al., 2001) and Spanish (Monterrey and Sanchez-Segura, 2007) markets, among others. On the other hand, Abdel-Khalik (1990) Davis et al. (1993), Stein et al. (1994), O'Keefe et al. (1994) or Firth (1997) failed to find a significant association. Moreover, Palmrose (1986a) showed that the presence of a positive sign in the mentioned relationship was not associated with the fact that the same audit firm was providing both services.

It is also remarkable, that until 2003, the vast majority of the publications focused on the relationship between audit and non-audit services have used the simple ordinary least square (OLS) regression method. The use of this methodology implies that the dependent variable (audit fees) is influenced by the independent one (additional services) and the positive transfer of knowledge, if any, flows from consultancy services to the auditing process (Firth, 1997 and 2002; Houghton and Jubb, 1999; Beattie et al., 2001; Ezzamel et al., 2002; O´Sullivan and Diacon, 2002).

During recent years, several authors have considered that the flows of knowledge could be generated in both-ways. The application of a simultaneous equation system offered, once more, mixed results: on the one hand Antle et al. (2006), Stein (2006) or McMeeking et al. (2006), among others, proved the presence of a

bilateral and positive influence. On the other hand, the results obtained by Krishnan and Yu (2011) were significant but negative, suggesting that the joint supply of services generates a cost reduction translated to the total bill paid by the customer, which also benefits from the transfer of knowledge. While Whisenant et al. (2003), Hay et al. (2006b) or De Fuentes and Pucheta-Martinez (2009) failed to confirm the presence of knowledge spillovers.

In contrast, the joint provision of audit and non-audit services has repeatedly been under scrutiny because it can increase the economic bond between clients and auditor, the bargaining power and the economic weight of the client on the auditor's portfolio may jeopardize the auditor's independence. In this regard, the *Enron* scandal and the subsequent Andersen's debacle initiated an international wave of auditor's independence regulation, strengthened by the Sarbanes Oxley Act (2002) which banned the provision of most NAS by the same auditing firm.

The new auditor's regulation was followed by a set of studies whose main purpose was seeking the real basis for this impairment of independence fears (a critical analysis is provided by DeFond and Francis, 2005). Among this set of contributions, we find those of Schneider et al. (2006) which concludes that the provision of additional services does not seem to diminish the real independence but the apparent one and the latter may be altered by environmental or research design factors, among others. Hay et al. (2006b) concluded that the joint provision of services diminishes auditor's apparent independence although they could not empirically prove the consequences, if any, on real/perceived auditor's attitude. The study by De Fuentes and Pucheta (2009) in the Spanish market, characterized by a low litigation risk, shows that the provision of audit and additional services does not diminish auditor's independence, measured through the auditor's propensity to issue qualified audit reports.

Nevertheless, post-SOX audit literature reveals that the consultancy services provided by groups to which the audit firm belongs has decreased (Diehl, 2010 for the

UK; Griffin et al., 2009 in New Zealand; Ghosh and Pawlewicz, 2009 in the US, or De Fuentes and Sierra, 2013 in Spain) probably triggered by the international political pressure to avoid potential conflict of interests in the joint provision of audit and consultancy services that could jeopardize auditor's independence (Abidin et al., 2010).

To sum up, the archival literature regarding audit and non-audit fees shows diverse and somewhat contradictory results, not only in relation to the presence and direction of the transfer of knowledge, but also regarding auditor's independence. This may raise questions regarding the influence of potential moderating variables, which will be analyzed through meta-analysis: (a) endogeneity; (b) country or environment (c) period of time.

3.2.3. Internal control

Audit researchers have traditionally faced difficulties when approaching the relationship between internal control variables and audit fees due to frequent barriers in accessing company´s internal information. Even when access to this information has been obtained, results have not always corroborated what was expected: For instance, Walker and Casterella (2000) failed to find any statistically significant association between the presence of an internal auditor and the statutory auditor effort, the last being measured through the total audit bill.

Additionally, as suggested by Hay et al. (2006a), the application of different approaches and surrogates in the investigations increases the difficulties in applying meta-analysis techniques to the results disclosed in publications and the possibility of getting any statistically significant results. The recent meta-analysis of Hay (2013) on audit fees set up a positive relationship between internal control and audit fees through the analysis of the internal auditing variable.

But researchers have also focused their attention on the impact of the regulation that requires specific disclosures about the quality of the internal control system, such as SOX 2002, that requires disclosure of problems in internal control in the financial statements. Raghunandan and Rama (2006) analyzed the consequences of the implementation of SOX in 2002 and showed that companies that disclosed deficiencies in their internal control system paid up to 43% more in their audit bill than those that did not report any problem. Those results were corroborated, among others, by Hoitash et al. (2008), Hogan and Wilkins (2008) or Krishnan et al. (2008).

Along with the SOX, PCAOB (Public Company Accounting Oversight Board) publishes the internal control overview audit rules. Krishnan et al. (2011), analyzed the regulatory changes, in particular the adoption of audit rule AS5 replacing the former AS2, and its impact on audit fees. Krishnan et al. (2011) concluded that the fee premium related to weaknesses in internal control system under the AS5 is lower than under the former AS2. This result involves that there is a reduction in the number and/or extension of the procedures applied and this is reflected in the auditing costs.

Following Hay (2013), although results consistently show a positive and significant relationship between audit fees and the presence of internal audit services, it would be interesting to analyze other surrogates such as the presence of internal control weaknesses since they have not been contemplated under meta-analysis review. Additionally, according to our archival review, the relationship between internal control and audit fees could be influenced by other factors such as: a) period of time and b) context or environment, whose effects as moderating variables will be analyzed in the empirical section (see Section 3.4.3).

3.2.4. Corporate Governance

During the past few years, the efficiency and effectiveness of codes of corporate governance (CG) have been under the scrutiny of the academic community and, in particular, the implementation of mechanisms such as the audit committee (AC) or good practices related to the composition and functioning of the board of directors (BoD) might have a positive impact on the quality of the financial information reported. The empirical testing of those research questions has been the aim of several papers, where authors have tried to identify, among other topics, the impact, if any, of the CG attributes on the auditor's independence (i.e. propensity to include qualified/going concern opinions) and on the auditor's effort (and ultimately, *ceteris paribus*, on the audit fees), the latter being of particular relevance for the purpose of this study.

O'Sullivan (1999) applied both approaches and analyzed, for the UK, the implications of the Cadbury Report issued in 1992 and, specifically, the consequences of the audit committee and changes to the composition of the board of directors on the audit fees. His results show that the variables analyzed are not significant. He argues that the results might be the outcome of the combination of opposite directions, the downwards of the improvements on the internal control systems and the upwards of the increase in the demand of audit quality. Under the same context of analysis, similar results were found out by Goddard and Masters (2000) or Peel and Clatworthy (2001). Within the North American market, Carcello et al. (2002) examined the consequences of three characteristics of the Board of Directors, namely independence, diligence and expertise measured, respectively, through the number of non executive members, number of meetings in one year and professional experience of board members. Their results offer a positive and significant sign for those variables.

The same characteristics of independence, diligence and expertise have also been analyzed for the audit committee, but results are not consistent: Meanwhile Carcello et al. (2002) failed to find any significant result, Abbot et al. (2003)

discovered a positive relationship between the presence of the recommended characteristics of the audit committee (independence, diligence and expertise) provided that they are considered simultaneously with those referred to the Board of Directors. Regarding the measurement of AC or BoD expertise, Abbot et al. (2003) distinguished those committees where at least one member could be considered as a financial expert, and could provide the rest of the committee with expert financial knowledge, when negotiating with managers.

Goodwin-Steward and Kent (2006), Mitra et al. (2007), Vafeas and Waegelein (2007), Krishnan and Visvanathan (2009) or Zaman et al. (2011) also considered financial expertise as an explanatory variable of the audit committee effectiveness model.

The board of directors size is also frequently considered when capturing the relationship between audit fees and good governance practices (Knechel and Willekens, 2006; Krishnan and Visvanathan, 2009; Bliss, 2011). Also duality of the appointment as president of the board of directors and CEO (O´Sullivan, 1999; Peel and Clatworthy, 2001; Mitra et al., 2007; Zaman et al., 2011), the frequency of the AC meetings (Abbott et al., 2003; Goodwin-Stewart and Kent, 2006; Zaman et al., 2011) or the AC size (O´Sullivan, 2009; Vafeas and Waegelein, 2007; Zaman et al., 2011) have also often been included in the audit fees model when contemplating corporate governance mechanisms.

Finally, Knechel and Willekens (2006) analysis of the Belgian market shows that audit fees are higher when companies exhibit high financial risk, there is a large presence of independent members on the Board of Directors and they have implemented an audit committee.

After a careful review of prior literature, we evidence an increasing complexity in modeling the influence of corporate governance mechanisms, in particular the Board of Directors and Audit Committee characteristics, on the audit

fees. In our view, this increasing complexity provides good reasons for further analyzing this topic using meta-analytical techniques. We have classified the published studies according to the predominant contemplated characteristics, i.e. independence, diligence, professionalism, financial expertise, size and CEO/general manager duality. The environment and period of time analyzed have both been considered as moderating variables of results, as explained in the results section (see Section 3.4.4).

3.2.5. Research questions

As stated above, the review of the audit-fee literature rises some questions that we have addressed through meta-analysis techniques and that constitutes the core of this paper:

RQ1: Does the overall evidence on specialization/provision of NAS/quality of internal control/GC mechanisms support a statistically significant influence on audit fees?

RQ2: If so, which is the overall strength of the effect?

RQ3: Are results homogeneous across different studies?

RQ4: If not, can our moderator variables explain the lack of homogeneity?

RQ5: Is there any publication bias that could distort the overall results estimated through the meta-analysis?

In order to answer those research questions, we have used the sample and methodology explained in the following section.

3.3. Research method and sample

3.3.1. Sample selection criteria

To select our sample, we have carried out a comprehensive literature search from databases such as *Web of Knowledge (wok), SSRN* and from references included in articles. We have also conducted a manual search of the main accounting and financial journals (Contemporary Accounting Research, Auditing: A Journal of Practice &Theory or The Accounting Review, among others). Our analyses include papers from 1984 until mid 2012. We have chosen those empirical studies whose methodology follows the Simunic's (1980) audit fee regression model, which typically includes the natural log of audit fees as the dependent variable, and several explanatory variables, which we have further analyzed in our meta-analysis.

Our initial sample starts with 88 papers which we have classified into four groups according to the attributes we are analyzing (non-audit services, auditor specialization, internal control and corporate governance). We have excluded those articles without enough information to be meta-analyzed or that used the same primary data. However, when a study reported detailed data from different settings and time periods, we have included them as a separate analysis. This yields a final sample of 103 studies. Table 3.1 provides details about the characteristics of our final sample.

Table 3.1. Sample Distribution by Author

Authors	Date	Journal	Period	Country	Sample Size
Abbott, Parker & Peters	2006	AJPT	2000	US	429
Abbott, Parker & Peters	2012	CAR	2005	US	134
Abbott, Parker, Peters & Raghunandan	2003	AJPT	2001	US	492
Antle, Gordon, Narayanamoorthy & Zhou	2006	RQFA	1994-2000	UK	2 294
Antle, Gordon, Narayanamoorthy & Zhou	2006	RQFA	2000	US	1 570
Basioudis	2007	JBF&A	1996-1997	UK	1816
Basioudis & Ellwood	2005b	JAPP	2001	UK	349
Basioudis & Ellwood	2005a	FAM	1999-2000	UK	373
Basioudis & Francis	2007	AJPT	2002-2003	UK	506
Beattie, Goodacre, Pratt & Stevenson	2001	ABR	1998	UK	210
Blankley, Hurtt & MacGregor	2012	AJPT	2004-2007	US	5 978
Bliss	2011	A&F	2003	Australia	799
Boon, Crowe, McKinnon & Ross	2005	IJA	1993-2000	Australia	988
Boon, Crowe, McKinnon & Ross	2005	IJA	2001-2002	Australia	252
Broye	2009	CCA	2005	France	109
Cahan, Jeter & Naiker	2011	AJPT	2003-2007	Compustat / AuditAnalytics	9 565
Carcello, Hermanson, Neal & Riley	2002	CAR	1992-1993	US	258
Carson	2009	AR	2000	62 countries	8 223
Carson	2009	AR	2004	60 countries	9 223
Carson & Fargher	2007	A&F	1998	Australia	546
Carson, Fargher, Simon & Taylor	2004	IJA	1995-1999	Australia	200
Casterella, Francis, Lewis & Walker	2004	AJPT	1993	US	651
Charles, Glover & Sharp	2010	AAA	2000-2003	Compustat	4 320
Chi	2006	ICFAI	2000-2003	US	3551
Choi, Kim, Kim & Zang	2010	AJPT	2000-2005	US	16 559
Clatworthy & Peel	2007	JBF&A	2004	UK	9850
Craswell, Francis & Taylor	1995	JAE	1987	Australia	513
Cullinan	1998	AJPT	1993	US	993

Dao, Raghunandan & Rama	2012	AR	2006	US	1 382
Davis, Ricchiute & Trompeter	1993	AR	NS	US	98
De Fuentes & Pucheta-Martinez	2009	ARLA	2002	Spain	135
DeFond, Francis & Wong	2000	AJPT	1992	Hong Kong	225
Dunmore & Shao	2006	PAR	2002	New Zealand	86
Ezzamel, Gwilliam & Holland	2002	IJA	1995	UK	193
Ferguson, Francis & Stokes	2006	A&F	1998	Australia	681
Ferguson & Stokes	2002	CAR	1990	Australia	586
Ferguson & Stokes	2002	CAR	1992	Australia	466
Ferguson & Stokes	2002	CAR	1994	Australia	564
Fields, Fraser & Wilkins	2004	JAPP	2000	US	277
Firth	1997	CAR	1991 y 1992	Norway	157
Firth	2002	JBF&A	1996	UK	1 112
Francis, Reichelt & Wang	2005	AR	2000-2001	US	3 045
Fung, Gul & Krishnan	2012	AR	2000-2007	US	17 207
Giroux & Jones	2007	ABR	2000-2001	England and Wales	380
Gonthier-Besacier & Schatt	2007	MAJ	2002	France	109
Goodwin-Stewart & Kent	2006	A&F	2000	Australia	401
Griffin, Lont & Sun	2009	A&F	2002-2006	New Zealand	653
Griffin, Lont & Sun	2010	A&F	2000-2006	US	16 772
Gul & Goodwin	2010	AR	2003-2006	US	2 826
Hay & Jeter	2011	ABR	2003	New Zealand	174
Hay, Knechel & Li	2006b	JBF&A	1999	New Zealand	130
Hay, Knechel & Li	2006b	JBF&A	2000	New Zealand	156
Hay, Knechel & Li	2006b	JBF&A	2001	New Zealand	169
Hay, Knechel & Ling	2008	IJA	1995	New Zealand	130
Hay, Knechel & Ling	2008	IJA	2005	New Zealand	83
Higgs & Skantz	2005	AJPT	2000-2002	US	2716
Hogan & Wilkins	2008	CAR	Nov 2003 - Nov 2004	Compustat	6 735

Hoitash, Hoitash & Bedard	2008	AJPT	Nov 2004 - Octubre 2005	Compustat	2 501
Houghton & Jubb	1999	JIAAT	1987 y 1988	Australia	270
Huang, Liu, Raghunandan & Rama	2007	AJPT	2000	US	936
Huang, Liu, Raghunandan & Rama	2007	AJPT	2001	US	993
Huang, Liu, Raghunandan & Rama	2007	AJPT	2003	US	1 345
Huang, Liu, Raghunandan & Rama	2007	AJPT	2004	US	1 345
Huang, Raghunandan & Rama	2009	AJPT	2006	Compustat	1 882
Jensen & Payne	2005	AJPT	1998	US	228
Khalil, Magnan & Cohen	2008	AJPT	2004	Canada	176
Knechel & Willekens	2006	JBF&A	2001	Belgium	429
Krishnan, Krishnan & Song	2011	AJPT	2006-2008	US	4 689
Krishnan, Rama & Zhang	2008	AJPT	2003-2005	US	55
Krishnan & Visvanathan	2009	JAA&F	2000-2002	US	801
Krishnan & Yu	2011	MAJ	2000-2006	US	11 899
Lee	2005	MAJ	2002	US	504
Lee & Mande	2005	QJBE	2000	US	780
Lowensohn, Johnson, Elder & Davies	2007	JAPP	2003	US	241
Mayhew & Wilkins	2003	AJPT	1991-1997	US	2 294
McMeeking , Peasnell & Pope	2006	ABR	1985-2002	UK	3 240
Mellet, Peel & Karbhari	2007	FAM	2001	UK	110
Messier, Reynolds, Simon & Wood	2011	AR	2000-2005	US	33 928
Mitra, Hossain & Deis	2007	RQFA	2000	US	358
Munsif, Raghunandan, Rama & Singhvi	2011	AH	2004-2007	US	1 610
Numan & Willekens	2012	JAE	2005-2006	US	2 637
O'Keefe, Simunic & Stein	1994	JAR	1989	US	249
O'Sullivan	1999	EAR	1995	UK	146
O'Sullivan	2000	BAR	1992	UK	313
O'Sullivan	2000	BAR	1992	UK	402
O'Sullivan & Diacon	2002	IJA	1992	UK	85

Palmrose	1986a	JAR	1981	US	298
Palmrose	1986b	JAR	1980-1981	US	361
Peel & Clatworthy	2001	CG	1992	UK	132
Pong & Burnett	2006	MAJ	1997 y 2001	UK	1 000
Raghunandan & Rama	2006	AJPT	2004	Compustat	660
Simunic	1984	JAR	1977	US	130
Simunic	1984	JAR	1977	US	133
Stein	2006	CAR	2001	US	3 053
Taylor	2011	AJPT	2005	Australia	822
Vafeas & Waegelein	2007	RQFA	2001	US	410
Vafeas & Waegelein	2007	RQFA	2002	US	356
Vermeer, Raghunandan & Forgione	2009	AJPT	2003	US	125
Whisenant, Sankaraguruswamy & Raghunandan	2003	JAR	2001	US	2 666
Yatim, Kent & Clarkson	2006	MAJ	2003	Malaysia	736
Zaman, Hudaib & Haniffa	2011	JBF&A	2001-2004	UK	540
Zerni	2012	CAR	2003-2007	Switzerland	862

A&F: Accounting and Finance; AAA: American Accounting Association; ABR: Accounting Business Research; AH: Accounting Horizons; AJPT: Auditing A Journal of Practice and Theory; ARLA: Academia-Revista Latinoamericana de Administración; BAR: British Accounting Review; CAR: Contemporary Accounting Research; CCA: Comptabilité-Contrôle-Audit; CG: Corporate Governance; FAM: Financial Accountability & Management; ICFAI: ICFAI Journal of Audit Practice; IJA: International Journal of Auditing; JAA&F: Journal of Accounting, Auditing & Finance; JAE: Journal of Accounting, Auditing & Finance; JAPP: Journal of Accounting and Public Policy; JAR: Journal of Accounting Research; JBF&A: Journal of Business Finance & Accounting; JIAAT: Journal of International Accounting, Auditing and Taxation ;JIFMA: Journal of International Financial Management and Accounting; MAJ: Managerial Auditing Journal ;PAR: Pacific Accounting Review; QJBE: Quarterly Journal of Business and Economics; RQFA: Review of Quantitative Finance and Accounting; AR: The Accounting Review; EAR: The European Accounting Review.

3.3.2. Meta-analysis

Meta-analysis applies statistical procedures to empirical results obtained from individual studies by integrating, synthesizing and quantifying the previous evidence, with the objective of estimating a homogeneous measure or effect size. This

effect size stands as the magnitude of the relationship between the variables selected due to their relevance or interest (Wolf, 1986; Rosenthal, 1991; Hunter and Schmidt, 1990). In the course of the last twenty years, researchers have been focusing their attention towards meta-analytic procedures as an alternative to the traditional literature review, the main advantages of meta-analysis being its ability to detect small variable influences and evaluate moderating variables which can be the answer to the apparently conflicting findings provided by the independent studies.

In this study, we have applied Hunter & Schmidt´s (1990) meta-analytic techniques and the Stouffer test (Rosenthal, 1991), widely used in the economic arena (see Hay et al., 2006a; Sanchez-Ballesta and García-Meca, 2005 or Sanchez-Ballesta and García-Meca, 2007, among others).

The final goal of using these meta-analysis techniques is fourfold:

a) To calculate the combined levels of significance.
b) To compute the effect size estimate of the chosen variables.
c) To establish homogeneity analysis and find evidence of moderating effects that could influence the results.
d) To explore publication bias.

a) Calculating the combined levels of significance.

The first stage in the meta-analysis is to compare significance levels. This procedure is implemented to address the question of whether the independent variable under scrutiny has a significant effect on audit fees in any of the context in which it was studied.

When comparing significance levels, the first step is to test the null hypothesis that all effects are insignificant. If we reject the null hypothesis then we

conclude that there is a significant effect in at least one study. To that end we apply the Stouffer test which combines the p-values of the primary studies that analyze the empirical relationship among our variables of interest to get a Z-statistic and its associated p-value. Following Hay et al. (2006a), we compute the Stouffer test, which converts the one-tailed p-values to their analogous Z-scores instead of *t*, adds them and divides the result by the square root of the number of studies. In those studies that directly reported the *t*-test statistic, we decided to convert *t* into its p-value. Microsoft Excel provides transformation formulas for these cases. In order to show the accurate direction of the effect, we add a positive sign when the effect is positive and a negative sign when the relationship between the variables is negative (Rosenthal, 1991, pp. 72-73). The final statistic shows a Z distribution allowing us to answer the null hypothesis of no association between the natural log of the audit fees and our relevant variables: non-audit services, auditor specialization, internal control and corporate governance.

The Stouffer test offers many advantages over other methods. First of all, the results are straightforward and do not require logarithmic transformations or adjustments for degrees of freedom, unlike the Fisher procedure or the Winer method (Wolf, 1986). In addition, through the use of this technique we can examine the potential endogeneity between the audit fees and the independent variables, when they are simultaneously determined. We have differentiated those articles which use two-stage least squares (2SLS) from those that estimate their models using the ordinary least squares (OLS).

Nevertheless, since the p-values can be biased by the size of the sample on which their studies are based, we have also estimated the weighted Stouffer test (Rosenthal 1991, p.89) and the conclusions, although no reported, are similar to the unweighted Stouffer test.

b) Computing the effect size estimate of the chosen variables.

The second stage of the meta-analysis examines effect sizes from the pool of studies. We have chosen the Pearson correlation coefficient (r) as the effect size accurate measure which explains the strength of the relationship that needs to be tested. Nevertheless, it´s important to clarify that, since the primary research studies are based on a multiple regression, calculating r from t-test statistics or p-values is biased, given that the *t* statistic is affected by the rest of the independent variables. Therefore, the estimated correlation coefficients (r_i) will include information regarding the partial correlation between the independent variables. Nonetheless, and despite of this limitation, by using the Pearson correlation coefficient we can further develop the findings provided by the Stouffer test.

Following Rosenthal (1991), we convert the p-values to its standard normal deviate equivalent Z, and finally, we estimate the Pearson correlation coefficient from the following formula:

$$r = \sqrt{\frac{Z^2}{N}} = \frac{Z}{\sqrt{N}}$$

We used formulas given by Hunter & Schmidt (1990) to compute the weighted mean of the observed correlations ($\overline{r}$) between the set of studies that combines our dependent variable, i.e. natural log of the audit fees, with our relevant independent variables.

c) Establishing homogeneity analysis and finding evidence of moderating effects that could influence the results.

We want to know if effects of independent variables are homogeneous across studies. If effect magnitudes are heterogeneous then it would be misleading to pool

the estimates and the source of differences should be traced. We undertake several techniques to analyze the homogeneity depending on the methodology applied:

Under the Stouffer method, according to Rosenthal (1991), we obtain the statistical significance of the heterogeneity of the Zs, from an $\mathcal{X}^2$computed as follows:

$$\sum (Z_i - \bar{Z})^2$$

With degrees of freedom k-1, with k being the number of studies, if the resulting value is higher than the critical statistical significance level, we reject the null hypothesis of homogeneity. The corresponding columns of this test are reported in the Stouffer method panels.

On the other hand, considering the formulas developed by Hunter & Schmidt (1990), we use three tests in order to assess if the observed r values are homogeneous $S_p^2 = 0$, i.e. if the correlation coefficients r_i may be affected by sampling error e_i . The first test requires to weigh each r_i by its sample size to correct for sampling errors. If the population variance $S_p^2 > 0$, then it would indicate that the r_i comes from populations with different correlation coefficients, i.e. the presence of heterogeneity, and we would have to identify moderators that explain the results. To that end we use the 75% rule, namely that if the 75% or more of the observed variance is explained by the sampling error $\lfloor (100)\, S_e^2 / S_r^2 > 75\% \rfloor$, we assume homogeneity in the results. In second place we report a 95% confidence interval around the true score correlation (r), where we assume the heterogeneity of the r_i (random-effects model). And finally, we conduct a Q test $\lfloor Q = k(S_r^2 / S_e^2) \rfloor$, which follows a $\mathcal{X}^2$ distribution with degrees of freedom k-1. If this statistic is not significant, we accept the null hypothesis of homogeneity and it would not be necessary to look for moderating variables that explain the true variance across studies.

In case we find evidence of heterogeneity in our results, we will identify and analyze the moderating variables, chosen from our previous narrative review that could influence the relationship between the audit fees and our variables of interest.

d) Exploring publication bias.

Given that the publication system seems to prefer those studies with statistically significant results, the empirical relationships obtained through the meta-analytic procedures may be larger than they should be. This publication bias towards significant results, called "file drawer problem", represents the possibility of finding a type I publication bias error in the published results due to research studies without a significant effect being more likely to be discarded in the file drawers (Wolf 1986, p.37).

In order to address this question, we have computed the *Fail Safe N* (Rosenthal, 1979). This statistic determines the number of additional non-published studies in a meta-analysis that would be necessary to bring down the overall probability obtained from the Stouffer test to a nonsignificant value at 0.05. However, since this approach has been criticized (Stanley, 2005), we have applied additional tools to observe and treat this problem.

First, we examine the potential effects of publication selection through funnel plots. A funnel plot consist in a scatter diagram of our effect sizes against the precision of each study (Stanley et al., 2008). Study precision is a measure of the variability of our estimates, being the standard error and precision (inverse of standard error) the best choices (Sterne and Egger, 2001; Stanley et al., 2008). The effect sizes estimated from larger studies will be placed on top of the graph, while the smallest will scatter broadly at the bottom. In absence of bias, the shape of the plot corresponds to a symmetrical inverted funnel with straight lines indicating the 95% confidence interval around the effect size. In that case, the spread will be only due to changes in sample size. However, asymmetry in a funnel plot can also be caused by other reasons apart

from bias, such as heterogeneity due to differences in the database or the period of time. Therefore, we shouldn´t base our inferences just on visual examination.

Second, we introduce a meta-regression model to test statistically publication selection and the variability among our effects. Following Stanley et al. (2008), our MRA model can be defined as:

$$Y = X\beta + \varepsilon$$

In this model, Y is the nx1 dependent variable vector representative of the audit fees literature, $X\beta$ is the explanatory and moderator model and ε is the nx1 vector of residuals.

As Stanley et al. (2008) remark, the β represents the regression coefficient of the true underlying empirical effect under consideration. In our empirical revision of literature, it identifies the magnitude of the relationship between the audit fees and essential issues for researchers (in this case consisted of non-audit services, auditor's specialization, internal control system weaknesses and mechanisms of good governance). The differences observed in the reported coefficients can be synthesized in the following model:

$$b_j = \beta + \sum_{k=1}^{K} \alpha_k \, \mathrm{Z}_{jk} + \beta_0 Se + e_j$$

Where b_j is the reported estimate of β (the coefficients of our variables under scrutiny) of the *j*th audit fee paper in an empirical literature of N studies, Z_{jk} is the vector of explanatory and moderator variables modelled to represent relevant characteristics, and therefore determine the potential heterogeneity found. The meta-

regression coefficients are expressed in the α_k, through the standard error(Se) we introduce a measure of precision that tries to test and correct publication bias, meanwhile e_j refers to the meta-disturbance term.

Accounting for heteroscedasticity caused by e, leads us to estimate by weighted least squares (WLS) instead of ordinary least squares (Stanley et al., 2008). Hence, the previous MRA model is divided by the reported standard error:

$$t_j = \frac{b_j}{Se_j} = \beta_0 + \beta\left(\frac{1}{Se_j}\right) + \sum_{k=1}^{K} \frac{\alpha_k \, \mathrm{Z}_{jk}}{Se_j} + \upsilon_j$$

As a result, the dependent variable is now t_j the t-value of the reported effect in a *j*th study. The t-test of the intercept coincides with the funnel asymmetry test (FAT) (Egger et al., 1997). And, by doing so, we obtain a test of the asymmetry plotted in our funnel graphs. With publication selection, β_0 is significant, indicating its estimate the direction of the bias.

Apart from providing this information, a significant result for the coefficients of precision ($\frac{1}{Se_j}$) and moderator variables (Z_{jk}) serves as the precision effect test (PET) (Stanley, 2005), which reveals the genuine empirical effect corrected for publication bias.

3.4. Results

In tables 3.2 to 3.5 we present results obtained by applying either the Stouffer (Panel A) or the Hunter & Schmidt (Panel B) tests, respectively. The first two columns provide information regarding the data used for each variable and the number of

studies that we considered for the analysis. Additional columns offer results obtained according to the methodology applied which we explain in the following section. We also discuss the potential publication bias analysis (Panel C).

3.4.1. Auditor specialization

Prior meta-analysis literature had identified several measures of specialization, but only in Hay (2013) the results have been reported separately, distinguishing among city and national leadership. We have further explored different approaches to specialization, since it seems to be one of the main concerns among researches in the last years. To that end, as described in the prior section, we have specified the measurement of specialization including different scopes such as city, national and both levels but also the market share. According to the conclusions drawn in previous publications, we have also distinguished between period pre and post-SOX and higher and lower clients' size.

Data presented in Table 3.2- Panel A shows that within the 39 published works that explored auditor specialization considerations, 21 showed a positive statistically significant relationship with audit fees, 1 offered a negative one and 17 studies failed to find any association at all. Results offered by the meta-analysis to the whole set of published studies show that industry specialization is positively related to audit fees (p= 0.000 according to the Stouffer test), therefore, it seems that, generally speaking, the higher the inferred knowledge of the auditor on an specific industrial sector, the higher the audit fees. In other words, auditors' investment in acquiring experience and knowledge in a certain industrial sector may be offset by increasing audit fees.

Regarding the *File Safe N*, the fail safe number column exhibits that we need at least 1 906 studies with null results to lead us to fail to reject the null hypothesis of

no significant effect of specialization. Thus, we can be fairly confident that there is a significant effect of the auditor's specialization of the audit fees.

The significant influence has also been corroborated by the Hunter and Schmidt analysis (data offered in Table 3.2- Panel B) which shows that the correlation between auditor's specialization and fees offers a mean value of 0.036 with an interval of confidence of 95% for the value to be included in the [0.027 ; 0.045] interval. However, the hypothesis of homogeneity is consistently refused by the two homogeneity contrasts applied: the 75% test and the Q Tobin statistic. Only 39.52% of the observed variance is due to sampling error, therefore the differences within the published outputs are due to unobserved/underlying variables that could explain the conflicting results.

In order to deeper analyze the sources of the heterogeneity identified, we classified the sample according to the following categories:

The different proxies for auditor's specialization identification used throughout the wide range of studies: Some authors have identified specialized auditors as those which command a certain market share (Craswell et al., 1995; DeFond et al., 2000), meanwhile other researchers have identified the specialized auditor as the leader in the particular industrial sector either at a national or city level, or both (Francis et al., 2005; McMeeking et al., 2006; Carson and Fargher 2007).

The different periods of time considered in the archival literature, that may relate to changes in the regulatory environment, such as the implementation of SOX (2002), which can also modify audit demand attributes including the auditor's specialization valuation by the audit market (Casterella et al., 2004).

Clients' sizes. The bargaining power of the audit customers, measured trough the clients' assets, may also influence the audit premium due to specialization

(Casterella et al. 2004), for instance Carson and Fargher (2007) have found that the fee premium charged by auditor specialists is only associated to the largest companies.

Results provided in Table 3.2 show that although 17 studies didn't report significant influence of the auditor's specialization on the dependent variable, the meta-results show that there is an overall positive impact on audit fees, regardless of the proxy applied. Under the Stouffer method, the homogeneity contrast is accepted when the auditor is the leader in a certain industrial sector and at the city level (p = 0.404). When the approach to specialization is at the national along with the city level the results are less consistent (p = 0.011) although still showing homogeneity.

Table 3.2-Panel B exhibits that the mean correlation between audit fees and auditor specialization, using the leadership of an industrial sector at the city level as a proxy is 0.057. Results obtained through the homogeneity tests, the 75% test and the Q statistic respectively, also validate the results of the Stouffer method. As we appreciate, 74.59% of the observed variance is explained by the sampling error. We can conclude that industry leadership affects audit fees mainly when it is found at city level. Basically, this may be considered as the starting point for the market to recognize and price auditor specialization.

The *market share* proxy is also a factor to take into account regarding the auditor industry specialization/audit fee relationship, since 97.80% of the variance is explained by sampling error, following the Hunter & Schmidt method. However there is a significant divergence between the Hunter & Schmidt and Stouffer methods in terms of homogeneity, which could be driven by the influence of the higher sample size of one primary study over the results of Stouffer´s homogeneity test.

The variable *joint leadership* also assumes the homogeneity of correlations ($S_p^2 < 0$, Table 3.2 − Panel B). However, since the meta-analysis consists of only 4 studies, it would be necessary to increase the number of published data in order to obtain more robust results.

Table 3.2. Meta-analysis on Specialization and Audit Fees

Panel A. Stouffer method

Independent variable	Sample	Studies	Number of significant results: Positives	Neg.	No significant	Stouffer test: p-value	Sign	Fail Safe N p=0,05	Homogeneity contrast: X^2_{k-1}	p-value
Specialization	132 333	39	21	1	17	0.000	+	1 906	135.017	0.000
Moderator variables										
Identification										
City-level leadership	9 333	7	5	0	2	0.000	+	79	6.178	0.404
National-level leadership	33 386	9	3	1	5	0.000	+	36	48.809	0.000
City and national-level leadership	4 271	4	3	0	1	0.000	+	54	11.130	0.011
Market share	61 024	20	12	0	8	0.000	+	605	56.926	0.000
Period of time										
Prior SOX	9 778	9	5	0	4	0.000	+	101	43.619	0.000
Post-SOX	8 394	5	3	0	2	0.000	+	18	4.981	0.289
Auditee size										
Upper segment	6 424	9	3	0	6	0.007	+	11	9.401	0.310
Lower segment	6 377	9	4	0	5	0.000	+	52	5.439	0.710

Panel B. Hunter and Schmidt method

Independent variable	Sample	Studies	r	S^2r	S^2e	S^2p	Homogeneity contrasts: % Variance Explained	Interval of confidence 95% Min.	Máx.	X^2
Specialization	132 333	39	0.036	0.001	0.000	0.000	39.52	0.027	0.045	98.67**
Moderator variables										
Identification										
City-level leadership	9 333	7	0.057	0.001	0.001	0.000	74.59	0.033	0.080	9.38
National-level leadership	33 386	9	0.032	0.001	0.000	0.001	33.08	0.014	0.051	27.21**
City and national-level leadership	4 271	4	0.108	0.000	0.001	-0.001	100.00	0.093	0.122	1.02
Market share	61 024	20	0.045	0.000	0.000	0.000	97.80	0.037	0.053	20.45
Period of time										
Prior SOX	9 778	9	0.059	0.004	0.001	0.003	21.21	0.017	0.102	42.44**
Post-SOX	8 394	5	0.044	0.000	0.001	-0.000	100.00	0.032	0.055	1.39
Auditee size										
Upper segment	6 424	9	0.010	0.002	0.001	0.001	61.27	-0.021	0.042	14.69
Lower segment	6 377	9	0.050	0.001	0.001	-0.000	100.00	0.026	0.073	8.15

** 1% significant * 5% significant

Table 3.2. Meta-analysis on Specialization and Audit Fees (cont.)

Panel C. Meta-regression of auditor specialization and audit fees

	Dependent variables		
	Basic Model (t)	Basic Model Market Share (t)	Model with moderators Market share (t)
Intercept	0.849 (2.35) *	0.570 (1.79)	1.055 (2.47) *
1/SE	0.026 (4.17) **	0.037 (6.43) **	0.014 (1.20)
US/SE			0.025 (2.22) *
Prior SOX/SE			-0.008 (-0.47)
Post-SOX/SE			-0.017 (-0.17)
N	39	20	20
F-statistic	17.36	41.34	13.25
R^2	31.94	69.67	77.94

** 1% significant * 5% significant
t-values are reported in parenthesis

The second moderator variable, the SOX regulation reveals to be a positive and significant influence in the relationship between specialization and audit fees ($p<0.01$, Table 3.2-Panel A), and the mean correlation shows (Table 3.2-Panel B) a higher value ($r = 0.059$) in the period prior to the SOX enactment than in the period after 2002 ($r =0.044$).

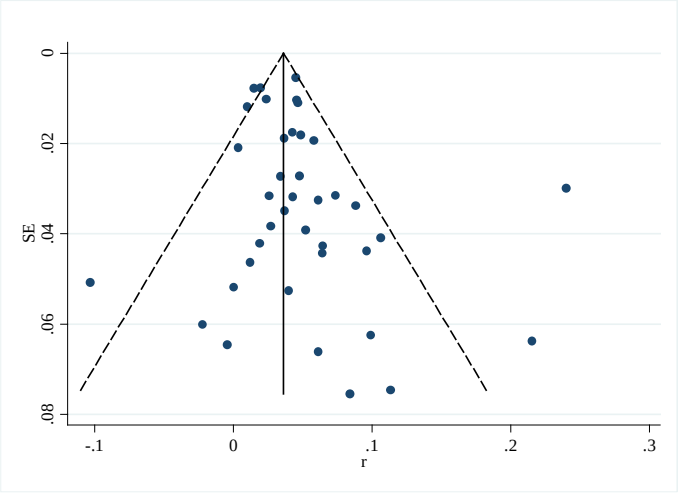
Regarding the homogeneity tests, they confirm the presence of this characteristic when the specialization premium is charged in the post-SOX period. Therefore, we can conclude that the relevant regulatory changes regarding the public accounting profession in 2002 led to an increase in the audit complexity and a higher demand for specialized auditors that would provide higher audit quality.

Finally, we have analyzed the impact of the client size as moderator variable. According to the Stouffer method, this variable also has a significant influence ($p<0.01$), although if only 11 papers for the upper segment report null results, the influence would be dropped. Initially, the results obtained through the Stouffer test would lead to consider client size as a source of diversity among results (p-value =0.310 and 0.710, in Table 3.2- Panel A). However, the Hunter y Schmidt test results (offered in Table 3.2-Panel B) prove that, for the bigger auditee companies, zero is included in the interval of confidence ($-0.021< r <0.042$) and therefore the correlation between the specified variables cannot be considered as significant. Those results support the conclusion reached by Casterella et al. (2004), in the sense that the specialization premium is sensitive to client size, since it can only be observed in the lower size market segment due to the bigger auditee clients seem to have greater bargaining power and it is difficult to identify the presence of a specialization premium charge in the audit fees.

In addition to the *Fail Safe N*, we have explored the publication bias through the funnel plot representing our 39 effect sizes against their standard error as well as the 95% confidence intervals (Figure 3.1). The shape of the graph is slightly skewed

on the left side, as a symptom of asymmetry and potential publication bias. We observe that the most precise study (SE = 0.005), placed on top of the plot, has a correlation of 0.045. On the contrary, the least precise one (SE = 0.075) gets a coefficient of 0.084 and obviously corresponds to the study with the smallest sample. Initially, it seems that the plot is more generous on the right side, with more observations on that part. However, the visual asymmetry is not clear and we proceed to corroborate this first inspection, with meta-regression techniques.

Figure 3.1. Funnel graph of auditor specialization and audit fees



In column 1 Table 3.2-Panel C we report the results for a basic meta-regression model of the relationship between the specialization of the auditor and audit fees. It is also the basis for the funnel asymmetry test and the precision effect test. We notice that the variable "auditor specialization", as a whole, shows publication bias (t-statistic=2.35). This fact arises the question whether the fee premium reported by researches in the specialization area could be the consequence of publication bias.

However, the significant coefficient of precision confirms that there is a genuine effect of the specialization on audit fees of 0.026. Hence, after removing the effect of publication selection, the premium charged by auditors as a consequence of their investment on experience and knowledge is around 3%.

In columns 2 and 3 of Table 3.2-Panel C we use again meta-regression procedures, using only a subset of the data, the one that measures specialization through the market share. We have opted for this proxy given that it is the only one with enough studies (more than 10) to draw reliable conclusions. It is worth mentioning, that there are slight signs of publication bias when the basic model is displayed (p-value= 0.09, t-statistic= 1.79), and more evident when moderators such as location or period of time are added (t-statistic=2.47). However, there is an underlying empirical effect after discounting publication bias of 0.037. With the exception of the researches placed on US, the rest of control variables associated with the market share of an auditor are not explanatory of the model. Therefore, potential omitted moderators variables could be the responsible of the differences found on the homogeneity tests between Hunter & Schmidt and Stouffer methods.

3.4.2. Non-audit services

Although in prior meta-analysis the provision of additional services was significant and positively associated to audit fees, we have explored several moderator variables in order to throw more light on the academic debate about the joint provision of both services, briefly presented in the previous section. According to results shown in Table 3.3, the provision of non-audit services is positively related to audit fees, being statistically significant at 1‰ level (Table 3.3- Panel A). This association is consistent using either the linear relationship, where non audit fees is an independent variable (OLS), or using the jointly-determined approach to fees negotiation (2OLS). Nonetheless, the *File Safe N* required when audit and non-audit fees are considered simultaneously determined is far lower (540) to the one observed for the OLS

estimation (11.694). Data provided by the Hunter & Schmidt analysis (Table 3.3-Panel B) shows that the use of linear models offers a higher correlation mean value (r= 0.127) than the one provided by more sophisticated models where endogeneity is considered (r=0.056).

Initially, it seems that the positive relationship between both variables remains regardless of which methodology is chosen by researchers (control for endogeneity or not). Nevertheless, since zero is included in the interval of confidence for the set of studies that do consider endogeneity between audit and non-audit services (-0.021< r <0.132), we conclude that the level of correlation between those variables is not significant. This result is in the same vein than Whisenant et al. (2003), since they assert that when audit and non-audit fees are jointly determined, the use of a system of simultaneous equations will provide statistical evidence of absence of relationship between both variables.

Since homogeneity tests are strongly refused in both analyses, we classified the different published works according to the following criteria:

Country or legal environment. The bargaining power of the auditor-client relationship may be affected by the legal environment and more specifically by the litigation risk perceived by the auditors. In this regard De Fuentes and Pucheta-Martinez (2009) provide empirical evidence of the influence of a low litigation risk environment on the auditor's independence.

Period of time. Once more, the temporary dimension of the analysis carried out by researches may affect the results. For instance, the joint provision of certain non-audit services by the audit firm was banned when the SOX (2002) was enacted and this may have triggered international political pressure to avoid potential conflicts of interest in the joint provision of audit and consultancy services. In this regard, Ghosh and Pawlewicz (2009) demonstrated that non-audit fees dropped after the enactment of SOX, as did Abidin et al. (2010) in the UK or Griffin et al. (2009) in

New Zealand. As a result, we could forward a significant impact in the relationship between non-audit services, audit fees and knowledge spillover, although the results of previous research remains uncertain and, in some cases, is even contradictory (Whisenant et al. 2003; Krishnan and Yu, 2011).

Unfortunately, the number of post-SOX publications that address this issue is insufficient to analyze the impact, if any, of the moderator variables. Therefore, we have reduced the analysis to the studies prior to the enactment of SOX in 2002 and we have classified them into the group of studies based on US and the group of studies based in any other country.

Regarding our first moderator variable, our results show that non-audit services have a significant influence on audit fees irrespective of the country from which the audit market is analyzed or the consideration of endogeneity (p-value <0.000, see Table 3.3-Panel A). However, a detailed analysis evidences that the results obtained in the US show low consistency when controlling for endogeneity (fail safe number 18). This lack of consistency is also revealed by the homogeneity contrasts reported in Table 3.3-Panel B: Low correlation coefficient (0.009) and an interval of confidence that includes zero (-0.032 <r< 0.050). On the other hand, the remaining studies carried out in countries other than the US, show a significant relationship between audit and non-audit fees, even when they are simultaneously determined (0.073 <r< 0.385). Overall, the meta-analysis provides empirical evidence of the transfer of knowledge, when the analysis is based on countries other than US.

When we consider the effects of our time-related moderator variable, the SOX implementation, the meta-analysis also offers a significant positive association between audit fees and non-audit fees (p<0.01, Table 3.3-Panel A). However, when endogeneity is taken into account, we observe that just 35 papers with null results are necessary to drop to a no significant effect this relationship and, furthermore, the interval of confidence includes zero (-0.012 <r< 0.117). The reason behind this lack of significance could be due to the scarce number of studies in this area (3). Therefore,

more insight it is necessary about the auditor´s regulation in order to provide robust findings since none of the moderator variables alone explain the heterogeneity of the results and, consequently, results are influenced by other factors. This findings would be in line with those reported by Charles et al. (2010), who demonstrated that the degree of audit fees reaction to financial risk have increased, mainly after the SOX implementation.

Table 3.3. Meta-analysis on Non Audit Services and Audit Fees

Panel A. Stouffer method

		Number of significant results				Stouffer test		Fail Safe N	Homogeneity contrast	
Independent variable	Sample	Studies	Positives	Negatives	No significant	p-value	Sign	p=0,05	X^2_{k-1}	p-value
Non audit services- OLS-	62 548	39	30	3	6	0.000	+	11 694	1 418.33	0.000
Non audit services-2OLS-	28 808	12	4	1	7	0.000	+	540	490.23	0.000
Moderator variables										
-OLS – (Non-controlled Endogeneity)										
Location										
US	25 085	12	8	2	2	0.000	+	888	332.59	0.000
Other countries	37 463	27	22	1	4	0.000	+	6 107	1082.12	0.000
Period of time										
Prior SOX	7 586	8	7	0	1	0.000	+	689	267.23	0.000
-2OLS- (Controlled Endogeneity)										
Location										
US	22 684	6	2	1	3	0.000	+	18	50.03	0.000
Other countries	6 124	6	2	0	4	0.000	+	338	398.45	0.000
Period of time										
Prior SOX	8 069	4	2	0	2	0.000	+	35	30.74	0.000

** 1% significant * 5% significant

Table 3.3 Meta-analysis on Non Audit Services and Audit Fees (cont.)

Panel B. Hunter and Schmidt method

Independent variable	Sample	Studies	r	S^2r	S^2e	S^2p	Homogeneity contrasts			
							% Variance Explained	Interval of confidence 95%		X^2
								Min.	Máx.	
Non audit services- OLS-	62 548	39	0.127	0.020	0.001	0.019	3.086	0.083	0.171	1 263.72**
Non audit services-2OLS-	28 808	12	0.056	0.018	0.000	0.018	2.269	-0.021	0.132	528.87**
Moderator variables										
-OLS – (Non-controlled Endogeneity)										
Location										
US	25 085	12	0.091	0.013	0.000	0.013	3.612	0.027	0.156	332.21**
Other countries	37 463	27	0.151	0.023	0.001	0.022	3.059	0.094	0.208	882.76**
Period of time										
Prior SOX	7 586	8	0.238	0.009	0.001	0.008	9.904	0.171	0.306	80.78**
-2OLS- (Controlled Endogeneity)										
Location										
US	22 684	6	0.009	0.003	0.000	0.002	10.118	-0.032	0.050	59.30**
Other countries	6 124	6	0.229	0.038	0.001	0.037	2.318	0.073	0.385	258.90**
Period of time										
Prior SOX	8 069	4	0.052	0.004	0.000	0.004	11.401	-0.012	0.117	35.08**

** 1% significant * 5% significant

Table 3.3 Meta-analysis on Non Audit Services and Audit Fees (cont.)

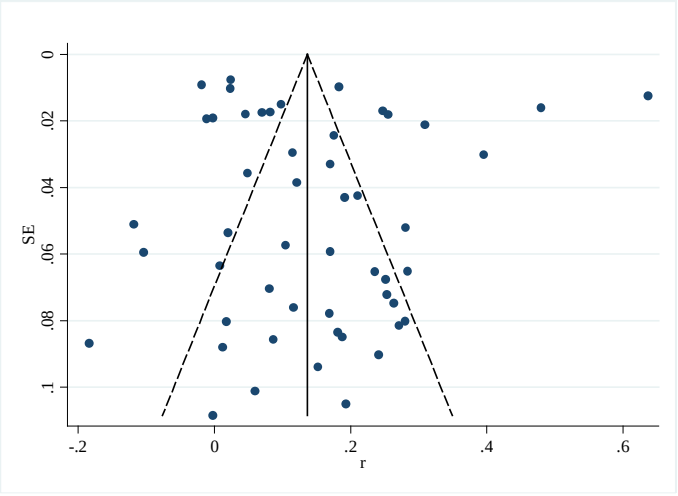
Panel C. Meta-regression of NAS and audit fees

	Dependent variables		
	Basic Model (t)	Model with moderators OLS (t)	Model with moderators 2OLS (t)
Intercept	1.398 (1.12)	0.353 (0.30)	0.906 (0.76)
1/SE	0.101 (3.58) **	0.078 (2.14) *	0.127 (4.35) **
OLS/SE		0.085 (2.12) *	
2OLS/SE			0.090 (1.37)
US/SE		-0.136 (-2.78) **	-0.212 (-2.72) **
Prior SOX/SE		0.201 (2.77) **	0.036 (0.47)
N	51	51	51
F-statistic	12.80	7.01	6.19
R^2	20.71	37.86	34.99

** 1% significant * 5% significant
t-values are reported in parenthesis

Figure 3.2 displays the funnel plot of the empirical effect of non-audit services on audit fees for our 51 studies. The shape of the plot is highly dispersed around the mean effect and with several observations outside the 95% confidence intervals. We observe that the provision of non-audit services has a huge impact on audit fees, with a wide range of results (-0.183 < r < 0.636). Studies with higher standard errors are spread at the bottom of the graph, while the most precise ones are at the top forming an inverted funnel plot. In this case, it is difficult to conclude only by a visual analysis whether its shape is symmetrical. We estimate the funnel test asymmetry (FAT) and the precision effect test (PET) to effectively detect and correct publication bias.

Figure 3.2. Funnel graph of non-audit services and audit fees



Column 1 in Table 3.3-Panel C presents our basic model for all the estimates of the effect sizes between non-audit services and audit fees. The constant coefficient is not statistically significant (t-value=1.12) confirming the absence of publication bias for this concept when we use the full data set. The slope coefficient is significant in the initial model and after introducing moderator variables (columns 2 and 3). Also, the F-statistic which tests the joint significance for the control variables and the precision variable is clearly significant and positive. Therefore, there is a genuine

relationship between non-audit and audit services not distorted by publication selection. Overall, the provision of non-audit services may increase audit fees around 10%. Following our previous meta-analytic analysis, our moderator variables are those related to the type of information (control for endogeneity or not), country and period of time. Consistently with our meta-analytic procedures, when the researcher controls for endogeneity, the relationship between both variables becomes not significant. Initially, we obtain a significant result when the legal environment is US. However, the zero is included in their interval of confidence. On the contrary, when other countries are taken into account, the coefficient we obtain is positive and significant (table no reported). As for the SOX implementation, it follows the same pattern as the one reported by the Hunter & Schmidt analysis.

3.4.3. Internal control

As Hay (2013) stated, the internal audit has variously been measured as internal audit expenditures, internal audit assistance, or ratio of internal audit to total asset. The expected sign depends on the substitutive-complementary argument: Under the former, the good quality of internal audit would trigger less external audit efforts, and therefore, less audit fees. Under the latter, when a company needs to improve its financial information, would rather invest in both internal and external controls (Hay et al., 2008). The results of the published papers collected in Hay et al. (2006a) were quite mixed and the meta-analysis showed a not significant association with audit fees. However, in the subsequent paper, the presence of internal audit turned out to be significant and positive, supporting the argument of complementarity between internal and external auditing.

We have explored the quality of the internal audit through an alternative approach, i.e. the material weaknesses in the internal control system reported by the external auditors. The overall results provided by the meta-analysis in Table 3.4 show that, as expected by the traditional auditing procedures, weaker internal control system

are associated with higher auditor effort and wider auditing tests, which result in higher audit fees. Statistical results show that this relationship is significant and consistent (Fail Safe N = 1 448). This strong fail safe value reflects the striking significance of the t-tests and p-values reported by the researches when material weaknesses are taken into account by auditors.

The mean value for correlation is 0.090 (Table 3.4-Panel B), and with 95% of confidence this value will be included within the [0.054 ; 0.126] interval.

As expected, homogeneity tests have been refused, so we have classified the set of papers according to variables that might reduce the heterogeneity of the results obtained:

Environment. Most of the archival data arises from companies based in the United States, United Kingdom or Anglo-Saxon countries. However, some authors have made comparisons between the auditor behavior in a set of countries, where data has been obtained from the Compustat database (Raghunandan and Rama, 2006; Hoitash et al., 2008; Hogan and Wilkins, 2008, Huang et al., 2009).

Period of time. Once more we have explored if the revised regulation of audit procedures related to the identifying and disclosing of internal control deficiencies approved in 2005 in the US (AS2, AS5) has triggered significant changes in the auditor efforts.

Table 3.4. Meta-analysis on Internal Control (Material Weaknesses) and Audit Fees

Panel A. Stouffer method

			Number of significant results			Stouffer test		Fail Safe N	Homogeneity contrast	
Independent variable	Sample	Studies	Positives	Negatives	No significant	p-value	Sign	p=0,05	X^2_{k-1}	p-value
Internal Control (Material weaknesses)	60 214	12	11	0	1	0.000	+	1 448	307.90	0.000
Moderator variables										
Location										
EE UU	47 776	7	7	0	0	0.000	+	646	269.79	0.000
Other countries	12 438	5	4	0	1	0.000	+	155	35.31	0.000
Period of time										
Prior AS2	1 320	2	1	0	1	0.001	+	5	2.39	0.122
Post AS2	18 176	7	7	0	0	0.000	+	428	79.41	0.000

Panel B. Hunter and Schmidt method

Homogeneity contrasts										
Independent variable	Sample	Studies	r	S^2r	S^2e	S^2p	% Variance Explained	Interval of confidence 95%		X^2
								Min.	Máx.	
Internal Control (Material weaknesses)	60 214	12	0.090	0.004	0.000	0.004	4.912	0.054	0.126	244.30**
Moderator variables										
Location										
EE UU	47 776	7	0.089	0.005	0.000	0.005	2.989	0.037	0.140	234.16**
Other countries	12 438	5	0.095	0.001	0.000	0.000	48.531	0.070	0.120	10.30*
Period of time										
Prior AS2	1 320	2	0.086	0.002	0.001	0.000	82.500	0.027	0.145	2.42
Post AS2	18 176	7	0.112	0.001	0.000	0.001	32.469	0.087	0.137	21.56**

** 1% significant * 5% significant

Table 3.4. Meta-analysis on Internal Control (Material Weaknesses) and Audit Fees (cont.)

Panel C. Meta-regression of internal control and audit fees

	Dependent variables	
	Basic Model (t)	Model with moderators (t)
Intercept	0.915 (1.10)	0.044 (0.04)
1/SE	0.080 (6.89) ***	0.079 (7.06) ***
Other countries/SE		0.003 (0.17)
Post AS2/SE		0.030 (1.62)
N	12	12
F-statistic	47.46	17.72
R^2	82.60	86.92

***1‰ significant ** 1% significant * 5% significant
t-values are reported in parenthesis

As reported in Table 3.4-Panel A, according to the Stouffer method, the first criterion of classification, location, has a positive effect on the association between internal control deficiencies and audit fees (p-value = 0.000). However, it does not mean that it represents a determining factor, since the homogeneity test is clearly rejected (X^2_{k-1} p-value = 0.000).

Results offered by the Hunter and Schmidt method (Table 3.4- Panel B), although complementary, reveal that the effect size is higher (r=0.095) when the studies are focused on countries different from the US. Furthermore, the percentage of the observed variance explained by the sampling error is high when the geographical setting is wider (48.53%). Even though, the homogeneity test is rejected with 5% of significance, we consider this finding undermines the effect of other potential moderators not included in the design of previous research.

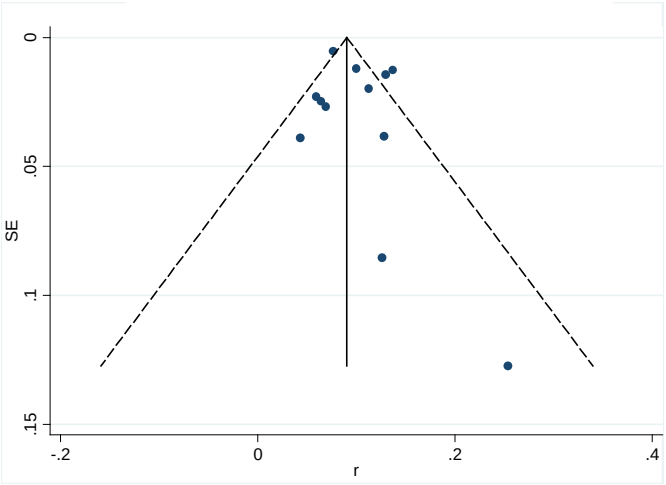
Our sample comprises a temporal range starting in 2003 and ending in 2007 but since our final goal is to analyze consequences on the audit market of the AS2 implementation, we classified our sample into periods prior to and post 2005. In both sub-periods of time the influence of the moderator variable is positive and significant (p-value<0.000, see Table 3.4-Panel A), although the segment prior to 2005 shows low consistency (Fail Safe Number = 5). However, since there are few publications included in the subsample, we cannot make robust inferences.

The Hunter and Schmidt method results (Table 3.4-Panel B) reveals that, in the post AS2 period, the correlation coefficient between internal control deficiencies and audit fees increases (r = 0.112 instead of r=0.086). According to prior research (Krishnan et al. 2011), the implementation of more restrictive audit rules regarding internal control, drives an increase in audit effort that has an effect on the audit fees.

Finally, we make a first attempt to explore publication bias through a funnel plot (Figure 3.3). As it can be seen, the correlations between internal control

weaknesses and audit fees are plotted on the horizontal axis and their standard error on the vertical one. In this case, the variety of the standard errors is lower than the reported previously through non-audit services or auditor specialization. Visually, it seems that, in general terms, the graph shows symmetry.

Figure 3.3. Funnel graph of internal control on audit fees



Columns 2 and 3 of Table 3.4-Panel C report the meta-regression results for the MRA model, with and without explanatory variables. As suggested by the funnel plot, the constant coefficient (the funnel asymmetry test) is not statistically significant (t-statistic=1.10), so we can conclude that our former meta-analytic results are not affected by publication selection. On the contrary, the slope coefficient is positive and highly significant (the precision effect test). This implies that internal control deficiencies truly affect audit fees, although none of our control variables is significant. A weak internal control system may have an impact on audit fees of 8%. Nevertheless, in order to test conveniently which moderator variables are genuinely influencing the data, more studies on this area are needed.

3.4.4. Corporate Governance

Generally speaking, although our work includes post Hay (2013) published papers, we have found similar levels of significance regarding BoD and AC characteristics: Both the independence of the board of directors, measured through the percentage of non-executive members over the total number of board members, and the relative number of board meetings in one year (labeled *diligence*) keep on being positively influencing auditor's effort. Also a more independent board will try to reduce the risk of future claims by increasing the demand of audit quality that will increase audit effort and audit fees. On the contrary, level of expertise and duality CEO/Chairman of the BoD do not show a significant relationship.

The chi-square test results reveal that homogeneity is accepted for the *diligence* variable ($X^2_{k-1} = 9.668$) meanwhile the null hypothesis is rejected for the variable that measures *independence* ($X^2_{k-1} = 28.03$ and p value = 0.009), both data reported in Table 3.5-Panel A.

On the other hand, the mean of chairs in different boards occupied by external members (labeled *expertise*) and the duality of the roles of President/CEO are not statistically significant no matter the methodology applied, since the Pearson coefficient value intervals include the zero value with 95% of confidence (Table 3.5-Panel B)

The size of the board of directors is statistically significant but we only managed to get 4 published works and the fail safe number test shows that the minimum number is 4, so the result, although significant is not conclusive.

One of the recommendations commonly included in every Code of Good Governance is the implementation of an Audit Committee (AC). The characteristics of the AC were analyzed offer different results: The bigger and more diligent AC the higher audit fees, and both associations are statistically significant (p-value< 0.00 Table 3.5- Panel A).

On the other hand, results regarding AC independence are somewhat contradictory. The Stouffer method offers statistically significant data, but according to Hunter and Schmidt the association of variables is not conclusive since the Pearson correlation coefficient does include zero (-0.002<r<0.080). Financial expertise is not statistically significant regardless of the method applied (p value 0.157, in table 3.5-Panel A and -0.023<r<0.047, Table 3.5-Panel B).

The homogeneity test is accepted only for the variables related to size and diligence of the committee. However, the empirical evidence regarding the size dimension is not very consistent since the fail safe test equals 8.

Since the homogeneity test regarding Board of Members independence is refused, we have clustered the studies that do contemplate this variable, through the use of the following classification:

Country. Financial scholars have largely used the traditional broad division between *common law* and *civil law* countries (LaPorta et al., 1998). But as Filatotchev and Boyd (2009) assert, within the common law countries there is substantial variation in terms of corporate governance regulatory traditions and implementations, with two different levels of enforcement, i.e. mandatory and voluntary regulation. A good example of the former is the strict legislation enacted in 2002, the US Sarbanes-Oxley Act, whilst the latter could be represented by the “comply or explain” approach, such as the UK Combined Code of 2003 (Balgobin, 2008).

Those differences across countries have been analyzed by, among others, Aguilera and Cuervo-Cazurra (2004, 2009), Zattoni and Cuomo (2008) or Zaman et al. (2011) and prompted us to consider the country as a moderator variable: We have classified the archival data according to either works rooted in the United States with a long tradition in CG, and also where strict regulation has been developed, and studies based in other *soft law* countries, where codes of governance are generally recognized as voluntary or merely recommendations.

Period of time. Since 1978, when we find the first Code of Good Governance in the US, until now, many codes and laws regarding good governance have been implemented across countries. Although specifying the period of time from which codes of good governance may have a greater influence on the auditing process represents a difficult and controversial task, according to Aguilera and Cuervo-Cazurra (2009), important regulatory changes or developments in this field and codes become more relevant in business strategy and policy making this century. For example, in the US, the Sarbanes-Oxley Act (SOX 2002) required to any listed company to have a fully independent audit committee. In the UK, the Higgs Report (2003) incorporated a series of recommendations to enhance board effectiveness. Also, Australian firms had to form an audit committee mainly composed of independent directors from the financial year 2004. Finally, regulatory changes from 2004 in New Zealand required that listed companies had an audit committee formed of at least three directors, two of whom must be independent.

After a careful examination of the corporate governance literature, and following Aguilera and Cuervo-Cazurra (2009) we decided to establish the 2000 year as a milestone, using prior and post 2000 as moderator variables.

Table 3.5. Meta-analysis on Corporate Governance Characteristics and Audit Fees

Panel A. Stouffer method

		Number of significant results				Stouffer test		Fail Safe N	Homogeneity contrast	
Independent variable	Sample	Studies	Positives	Negatives	No significant	p-value	Sign	p=0,05	X^2_{k-1}	p-value
CG- Board of directors										
Independence	5 778	14	8	1	5	0.000	+	147	28.03	0.009
Expertise	1 254	4	1	0	3	0.122	+	NA	5.39	0.145
Diligence	4 015	8	5	0	3	0.000	+	63	9.668	0.208
Size	2 765	4	2	0	2	0.012	+	4	5.112	0.164
Duality	4 343	9	2	0	7	0.668	+	NA	10.050	0.262
CG- Audit Committee										
Independence	5 254	12	6	0	6	0.001	+	31	26.33	0.006
Financial Expertise	5 183	9	2	1	6	0.157	+	NA	14.80	0.063
Diligence	4 217	8	4	0	4	0.000	+	94	8.31	0.306
Size	2 188	5	2	0	3	0.004	+	8	3.93	0.416
Moderator variables										
CG- Board of members- Independence										
Location										
EE UU	1 980	4	3	0	1	0.001	+	17	3.536	0.316
Other countries	3 798	10	5	1	4	0.000	+	56	23.67	0.005
Period of time										
Prior 2000	1 068	5	3	0	2	0.000	+	32	10.98	0.027
Post 2000	4 710	9	5	1	3	0.000	+	34	14.96	0.060

** 1% significant * 5% significant

Table 3.5. Meta-analysis on Corporate Governance Characteristics and Audit Fees (Cont.)

Panel B. Hunter and Schmidt method

Independent variable	Sample	Studies	r	S^2r	S^2e	S^2p	% Variance Explained	Homogeneity contrasts Interval of confidence 95% Min.	Máx.	X^2
CG- Board of members										
Independence	5 778	14	0.068	0.006	0.002	0.003	43.04	0.029	0.107	32.53**
Expertise	1 254	4	0.032	0.004	0.003	0.001	73.80	-0.032	0.097	5.42
Diligence	4 015	8	0.078	0.002	0.002	0.000	82.56	0.044	0.111	9.69
Size	2 765	4	0.046	0.002	0.001	0.000	92.20	0.008	0.085	4.34
Duality	4 343	9	-0.006	0.002	0.002	0.000	89.60	-0.038	0.025	10.04
CG- Audit Committee										
Independence	5 254	12	0.039	0.005	0.002	0.003	42.76	-0.002	0.080	28.07**
Financial Expertise	5 183	9	0.012	0.003	0.002	0.001	59.85	-0.023	0.047	15.04
Diligence	4 217	8	0.087	0.003	0.002	0.001	70.31	0.051	0.122	11.38
Size	2 188	5	0.058	0.002	0.002	-0.000	100.00	0.020	0.095	3.96
Moderator variables										
CG- Board of members- Independence										
Location										
EE UU	1 980	4	0.075	0.003	0.002	0.001	61.59	0.019	0.131	6.50*
Other countries	3 798	10	0.065	0.007	0.003	0.004	38.65	0.014	0.116	25.87**
Period of time										
Prior 2000	1 068	5	0.150	0.007	0.004	0.002	66.25	0.077	0.222	7.55
Post 2000	4 710	9	0.050	0.003	0.002	0.002	54.89	0.011	0.088	16.40*

Panel C. Meta-regression of corporate governance characteristics and audit fees

	Dependent variables	
	Basic Model Independence board (t)	Model with moderators Independence AC (t)
Intercept	1.515 (1.40)	1.676 (1.63)
1/SE	0.011 (0.22)	-0.009 (-0.19)
N	14	12
F-statistic	0.05	0.04
R^2	0.00	0.00

** 1% significant * 5% significant
t-values are reported in parenthesis

Results provided in Table 3.5-Panel A reveal that the homogeneity contrast is accepted when only considering those studies that have been carried out in the US (X^2_{k-1} = 3.536 and p-value = 0.316).

Within a context of high regulation and protection of stakeholders, such as the US, the mean correlation between audit fees and independence of the board of directors is 0.075 (see Table 3.5-Panel B). Even though it does not reach the limit of 75%, the 61.59% of the observed variance is explained by sampling error so we can conclude that the variable "US location" represents a good moderator for the results published and collected in this study.

Regarding the period of time analyzed, the mean correlation in the period prior to 2000 (r=0.150) is higher than in the post 2000 period (r=0.050). However, the homogeneity contrast is rejected for the post 2000 period, revealing that other variables influence this category and that a higher level of complexity should be used when attempting to measure the influence of corporate governance mechanisms.

Publication selection is displayed in figures 3.4 and 3.5. Given that there are not enough studies for all the characteristics under review, we have focused on the independence (14 and 12 papers), for both the board of directors and the audit committee. Figure 3.4 shows a graphic scheme slightly lopsided, reporting less observations on the left side. By contrast, figure 3.5 represents a plot rather symmetrical, although a close inspection remarks the fact that some points are outside the confidence interval.

Figure 3.4. Funnel graph of board of members (independence) and audit fees

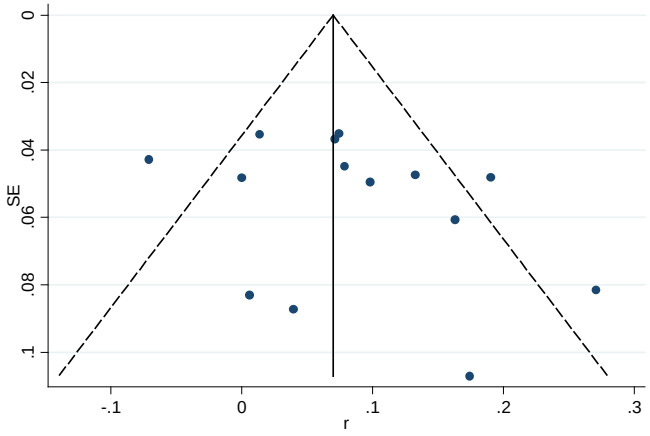
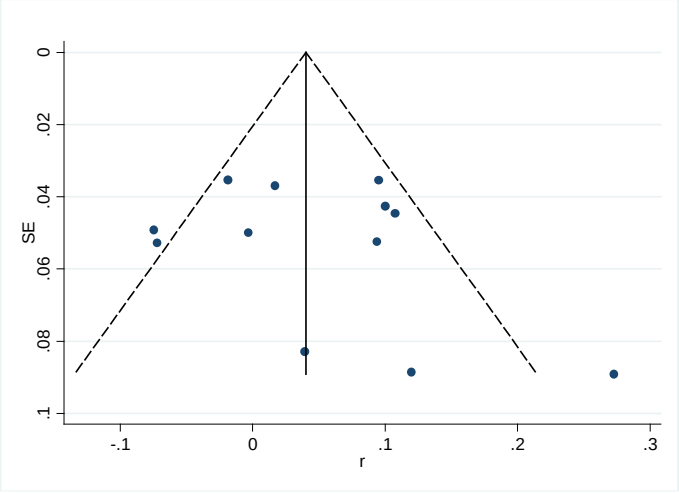


Figure 3.5. Funnel graph of independence of audit committee and audit fees



Unfortunately, when we try to obtain empirical evidence by the funnel asymmetry test or the precision effect test, we fail in providing substantial proof in any particular direction. As we appreciate in Table 3.5 Panel C, the R-squared for

these models is nearly zero. This failure is likely due to the lack of studies on this area which prevents from applying more accurate meta-regression techniques.

3.5. Conclusions

Over the past three decades, researchers have produced a great bulk of studies related to the audit market and, more specifically, the audit fees, some of them providing conflicting results in this field. Hay et al. (2006a) in his meta-analytic review of the principal variables that influence audit fees, provides a comprehensive first guide, subsequently extended to incorporate studies published between 2004 to 2007 (Hay, 2013). His most recent review enabled the clarification of some inconsistencies such as those related to internal audit.

However, Hay´s (2013) analysis does not reflect on all the complex issues that affect areas of growing interest related to audit quality such as the auditor's industry specialization, the joint provision of non-audit services, the implementation of corporate governance mechanisms or the presence of material weaknesses in internal controls. Also, as suggested by Hay (2013), it is necessary to incorporate more sophisticated and accurate techniques for exploring and disclosing the underlying genuine effect free of publication bias (Stanley, 2005; Stanley et al., 2008).

This study offers a meta-analytic review that covers a longer period and provides deeper view of the most relevant topics considered in recent literature than Hay's paper (2013), so it can be considered as an extension of the latter. In addition, our study provides not only an estimation of the effect size which measures the strength of the relationship between audit fees and our variables of interest, but also we examine potential moderating factors responsible for the lack of homogeneity among primary studies. Furthermore, our research exhibits empirical evidence of how publication bias is present in some areas of great interest for researchers and

regulators. And, finally, we synthesize the genuine empirical effect that lies in the variables under review, once publication selection is taken into account. Therefore, in our view, it assists researchers by creating solid foundations for their research questions and provides explanations for the contradictory results offered in the archival literature.

Our findings show that moderating factors such as different measures of auditor´s industry specialization, the client size, the country analyzed or the time period examined, moderate the relationship between our interest variables and audit fees. In short, our investigation provides evidence that the quality of the audit services measured through auditor industry specialization allows audit firms to earn an additional premium, but only when the differentiation strategy is perceived by clients at city-industry level. Also, although to a lesser extent, there is an audit fee premium when the auditor is both the national and the city-specific leader or when we use the concept of "market share" as a proxy for industry specialization. Publication selection seems to be present in the stream of the audit fees literature based on the auditor´s market share. Nevertheless, our analysis reveals the impact of auditor specialization on audit fees is around 3%.

Throughout last decade, the enactment of Sarbanes-Oxley (2002) has increased the demand for specialized auditors, but the fee premium of specialization is influenced by the bargaining power of the auditees, measured through the client size.

Regarding the debate concerning the joint determination of audit fees and non-audit fees, our results provide empirical evidence of a positive relationship between both variables, even after controlling for endogeneity. However, this relationship is highly sensitive to the institutional setting in which companies operate. Our findings are consistent with knowledge spillovers between the joint provision of audit and non-audit services, but only when the studies consider institutional settings

different from the US, in other words, economies characterized by less strict regulation. On the other hand, the time period does not seem to be a determinant driver in the relationship between audit and non-audit services, at least for the studies based on samples prior to 2002. Given the limited number of primary studies focused on the aftermath of 2002, we can not proceed with a more exhaustive analysis. Contrary to what was expected, publication selection does not bias our results, being the overall coefficient that measures the relationship of the provision of non-audit services on audit fees around 10%.

Our results also show that, the stricter the regulation regarding deficiencies in internal control, the higher the effort of the auditors and, consequently, the higher audit fees. We have measured that the premium charged by auditors to their clients to protect themselves from material weaknesses is 8%. No empirical evidence of publication selection have been found that may give the impression that the relationship between the internal control system and audit fees is higher than what it should be.

Finally, audited companies with a more independent and diligent Board of Directors do prefer higher quality financial statements supervision, that mitigate future litigation responsibilities. Regarding the influence of the audit committee on the auditor effort, further research is needed in order to offer robust results since our data only reveals weak significance. Unfortunately, it is also impossible to determine whether publication selection is skewing our results. We consider that a greater number of studies in this area may help to provide consistent outcomes.

Among the limitations of our study, we need to address those linked to the meta-analysis techniques by Hunter y Schmidt and related to those studies that provide multivariate regression analysis and that do not offer the correlation matrix of variables. In those cases, the transformation from the statistic t to r is not exact and the correlation between our variables of interest will be influenced by the remaining

variables. However, we have used this methodology in order to provide more robust results than those worked out with the Stouffer method alone. Other limitations are the low number of available papers in certain areas such as the corporate governance system, making it impossible the application of meta-regression techniques.

Additionally, the presence of other moderating factors not considered in the primary studies, and that are responsible for the percentage of variance unexplained by the sampling error, can also influence our results.

3.6. References

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CAPÍTULO 4. IFRS ADOPTION AND AUDIT AND NON-AUDIT FEES: EMPIRICAL EVIDENCE FROM SPANISH LISTED COMPANIES

4.1. Introduction

The purpose of our study is to provide deeper knowledge about the impact of the implementation of the International Financial Reporting Standards (IFRS) for quoted groups of companies in 2005 and the enforcement of the adapted IFRS for individual companies, through the new Plan General de Contabilidad[5] (in short, NPGC) in 2007, on audit and non-audit fees.

The evolution of audit prices remains a subject of particular concern among the regulatory bodies, which always watch the audit market behaviour. Good examples are General Accounting Office (2003, 2008) in the US, the UK Competition Commission Proposals[6] (2013) and the European Union's European Commission Green Paper (2010).

Within this strand of research, the current study responds to the European Union's call for contributions in its recent document "Public Consultation on the Impact of IFRS in the EU"[7] (2014). In particular, we provide evidence of one of the economic consequences of IFRS, i.e., the cost of the supervision of the financial information under the international accounting rules.

Notes:

[5] In English, General Accounting Plan

[6] From April 2014 the Competition and Markets Authority.

[7] See in: http://ec.europa.eu/internal_market/consultations/2014/ifrs/docs/consultation-document_en.pdf

This paper builds on prior literature (Diehl, 2010; Griffin et al., 2009; Kim et al., 2012; Vieru and Shadewitz, 2010). Particularly, Kim et al. (2012) analyse the impact on audit fees of mandatory IFRS adoption in 14 European countries. They estimate an IFRS-related premium of 5.44% that results from two counteracting forces, i.e., the increase in audit complexity and the decrease of audit fees associated with the improvement in the financial reporting quality. This study covers a wide geographical scope, but additional evidence from singular countries is needed since the authors do not address several country-specific features that may influence fee's behaviour. Therefore, the figure of 5.44% estimated for "a representative firm in countries that mandated IFRS adoption" (Kim et al., 2012, p. 2077) may vary significantly upon countries.

Our study is conducted in Spain, which constitutes a unique setting that deserves further attention for several reasons. First, to the best of our knowledge, no single study has addressed so far the impact on audit fees of two consecutive periods of accounting-related changes. Although a fee premium associated with the IFRS adoption is documented by Griffin et al. (2009) in New Zealand, Diehl (2010) in the UK or Vieru and Shadewitz (2010) in Finland, the expected sign of the variation in fees in the second benchmark period is elusive because the two counteracting forces on audit fees, i.e., increase in financial reporting quality and audit complexity (Kim et al., 2012), may vary their magnitudes in the subsequent accounting reform and, therefore, the net outcome may differ. In particular, the former local accounting standards differed significantly from IFRS (Bae et al., 2008; Callao et al., 2007; Cañibano and Gisbert, 2007; Carmona and Trombetta, 2008), but the main goal of the Spanish accounting reform in 2007 was to converge to the IFRS adopted for group accounts, following the Spanish tradition of a single, unique accounting system for all companies (Gonzalo-Angulo, 2014). Therefore, it is plausible to expect higher audit complexity in the first implementation period of accounting changes than in the second one. In addition, the same accounting firm supervises the group accounts and the parent company in nearly all cases and a great majority (90%) of the stock market

in Spain is audited by the Big 4, whose audit offices share common auditing methodologies, procedures and risk assessments. Therefore, the experience-based learning process may diminish the increase in audit complexity in 2008 and not exceed the enhancement of the accounting information. Although we cannot disentangle both effects, we report the global impact that may differ from the previous one, in 2005.

Second, the implementation of the international accounting rules was legally enforced not only for the consolidated but also for the individual accounts. Thus, our study covers the IFRS adoption on the entire population of listed companies and the analysis is conducted over homogeneous primary data. Kim et al. (2012) benchmark sample consists of adopter firms but do not distinguish between voluntary and mandatory adopters. The European Regulation 1606/2002[8] required only group accounts of listed companies to be prepared under the international accounting rules and left the adoption of IFRS for the remaining financial information to the Member States' choice. Therefore, the IFRS adoption process for voluntary versus mandatory firm adopters and across European countries was uneven and it constitutes a plausible reason, among others, for Kim et al. (2012) to report low degrees of IFRS implementation in the benchmark year 2005 in many countries (54% in Germany, 20% in the UK or 59% in Denmark, among others). We perform separated analyses over homogeneous groups of companies (all mandatory adopters) and financial statements (consolidated vs. individual) whose enforcement year of implementing new accounting standards was identical in each case (2005 and 2008, respectively). Therefore, the results exhibited in our analysis are not biased by the collateral influence, if any, of the voluntary adopters on audit fees.

Third, Kim et al. (2012) only focus on audit fees, but their results may be influenced by the engagement of consultancy services, because prior literature demonstrates that audit and non-audit fees provided by the same auditing group are

[8] Regulation (EC) 1606/2002 of the European Parliament and of the Council of 19 July 2002 on the application of international accounting standards.

interconnected (Antle et al., 2006; Krishnan and Yu, 2011; McMeeking et al., 2007; Stein, 2006; among others). To overcome this limitation, we document variations in non-audit fees and total fees. In Spain, two opposite drivers may influence the overall trend. On the one hand is the approval of the Financial System Reform Act[9] (hereinafter Financial Act) in 2002, restricting the joint provision of some consultancy services by the auditing firm. On the other hand, the new accounting reform, since the survey carried out by KPMG Auditores (2010), reveals that companies seek for additional consultancy services associated with the IFRS adoption in order to train their staff in the new accounting rules.

In sum, peculiarities as those that we described above and others such as diversity in audit market structures or the quality of the audit systems (Francis and Wang, 2008; Van Tendeloo and Vanstraelen, 2008) may prompt disparities in audit fee behaviours. Despite regulatory endeavour to harmonise the auditing service in Europe, significant diversity still persists across Member States (Garcia et al., 2014), and evidence from individual countries would help complete the puzzle of evidence (Maijoor and Vanstraelen, 2012).

To address our aim, we analyse audit and non-audit fees data for listed groups and parent companies in Spain from 2003 and 2009. We build fee models that have been well tested in prior research (in Spain by Carmona and Momparler, 2011; Monterrey and Sanchez-Segura, 2007 or Serrano et al., 2013) and estimate the audit and non-audit fee values from 2004 to 2009.

By comparing the real and predicted data (Menon and Williams, 2001 or Carson et al., 2012), we identify unexpected audit fee increases in 2004. We also observe positive coefficients in 2005 and 2006, but these coefficients show a weak level of significance. We apply similar procedures to the audit fee model for parent

[9] Ley de Medidas de Reforma del Sistema Financiero 44/2002, de 22 de noviembre. BOE 281 de 23 de noviembre del 2011.

companies' financial information and identify an unexpected increase in 2008 that is significant at the 1% level.

Menon and Williams (2001) found that the effects of individual accounting and auditing standards are marginal in terms of impact on fees but that, in aggregate, they are likely to be material. In addition, and according to the International Standards on Auditing 315 (ISA 315), the implementation of a new accounting framework increases the inherent risk of the financial information and, ultimately, increases the audit risk, resulting in higher prices. Therefore, we conclude that the significant shifts in audit prices that take place in 2004 and 2008 are reliably driven by the new accounting regimes.

In all, the two-step IFRS adoption process triggered two severe increases in audit prices. Our results concerning the new accounting standards for group accounts of listed companies confirm prior evidence (Griffin et al., 2009 or Kim et al., 2012). Regarding the implementation of NPGC, several reasons might explain the repeated shift in audit fees. Although IFRS were adapted through the NPGC, there are still important differences (Gonzalo-Angulo, 2014) between the national and international standards that might explain auditors' additional effort in knowledge acquisition discounted in higher audit prices. In addition, as stated above, the new accounting framework for individual companies would increase the audit risk again, following ISA 315.

We also analyse the behaviour of non-audit fees. Although this magnitude bumbles along the period of analysis, it exhibits negative coefficients that are significant in 2007. Therefore, the trend of real consultancy services is lower than the expected trend according to the benchmark year 2003, which is a plausible consequence of the national regulatory restrictions on the joint provision of audit and consultancy services, as suggested by Griffin et al. (2009). Nevertheless, there is an unpredicted and significant increase in 2008, both for individual and for consolidated

accounts, which is consistent with the higher demand of consultancy services due to the NPGC, as reported in the KPMG Auditores survey (2010).

We carefully review the outstanding regulatory changes that might affect the audit profession, including the Financial Act in 2002 and the Directive 2006/43/EC on statutory audits of annual accounts and consolidated accounts. The former is addressed in several sections of this paper, and the transposition of the latter to the national legislation was made through the Audit Law enacted in 2010,[10] which falls beyond the sample period of this work. However, we note that non-identified shocks such as other regulatory changes might have also affected the trend of the audit prices.

Additionally, we report on the behaviour of some control variables because they inform market competition features. In particular, we reveal that within a framework of flat prices for the whole audit market, audit fees of listed companies follow an outstanding increasing path. Specifically, the constant rate of growth (CRG) in real audit fees reported in both consolidated and individual financial statements is approximately 13%; moreover, in 2009, the rate doubles that reported in 2003. We cannot directly compare this figure with those reported in prior studies because their estimations are based on different years and samples, but we can reasonably claim that the growth rates of the audit fees in Spain are higher than in other countries. For instance, in New Zealand, the growth rate of nominal audit fees reported by Griffin et al. (2009) is approximately 11.5% during the 2002–2006 period. Abidin et al. (2010) estimated a 13% growth rate between 1998 and 2003 for UK domestic listed companies but also in nominal terms.

Our findings contribute to the existing literature in three ways. First, we examine one of the economic consequences of IFRS adoption, i.e., the significant

[10] Ley 12/2010, de 30 de junio, por la que se modifica la Ley 19/1988, de 12 de julio, de Auditoría de Cuentas, la Ley 24/1988, de 28 de julio, del Mercado de Valores y el texto refundido de la Ley de Sociedades Anónimas aprobado por el Real Decreto Legislativo 1564/1989, de 22 de diciembre, para su adaptación a la normativa comunitaria.

increase in audit fees. Second, we investigate the behaviour of audit fees in a particular setting, i.e., a country with a two-step IFRS implementation, where the significant audit fee increases are found not only in the first stage but also in the second stage and spread throughout several years. Third, we also contribute to the non-audit fees literature by describing the evolution of such fees throughout accounting and auditors' independence regulatory changes.

These contributions are relevant for audit firms and customers because they shed light on the economic costs that companies assume when they switch to enhanced accounting standards.

The remainder of this paper is organised in the following manner. In Section 4.2, we describe the Spanish setting. Sections 4.3 and 4.4 summarise previous research on audit fee determinants and present our research issues and methodology. The empirical results are reported in Section 4.5. Section 4.6 includes the robustness tests. Finally, our conclusions are presented in the last section.

4.2. The Spanish setting

4.2.1. The implementation process of IFRS in Spain

The final goal of the European regulation was to contribute to the efficient and cost-effective functioning of the capital markets set in Europe in order to compete within them and with other capital markets. Therefore, the main target of the new accounting rules was the financial information of capital market players. To that end, and following prior recommendations,[11] the European Regulation 1606/2002 requested that public traded companies prepare their consolidated financial

[11] Communication of the European Commission entitled "EU Financial Reporting Strategy: The way forward", Brussels 13.10.2000.

statements, according to the IFRS endorsed by the EU, for each fiscal year starting on or after 1 January 2005 (art. 4th of the European Regulation 1606/2002).

The endorsement mechanism in Spain was the enactment of the Law 62/2003 of 30 December on tax, administrative and social order measures[12], which modified some articles of the current Code of Commerce of 1885 and the former Public Company Law of 1989. The main reforms of the Law 62/2003 were to address the perimeter of consolidation, to require additional disclosures in some of the documents included in the financial statements and to contemplate the reasonable value, among other changes.

Regarding the implementation of IFRS on annual accounts of non-public traded companies, the European Regulation 1606/2002 allows a wide degree of freedom, establishing that Member States may permit or require:

(a) the companies referred to in Article 4 to prepare their annual accounts,

(b) companies other than those referred to in Article 4 to prepare their consolidated accounts and/or their annual accounts,

In conformity with the IFRS adopted. . . (art. 5 European Regulation 1606/2002)

The Spanish choice, following the recommendations of an expert committee, was that the individual accounting information of Spanish companies, including listed companies, should continue to be prepared under the accounting principles established by the Spanish accounting and commercial law (eleventh final provision of Law 62/2003). Meanwhile, the consolidated financial statements for companies other than those listed could be reported under the Spanish accounting standards or the European Community Regulation according to the parent companies' decision. As Cañibano and Gisbert (2007) asserted, the IFRS could have been adopted in a straightforward

[12] Ley 62/2003 de 30 de diciembre de medidas fiscales, administrativas y del orden social.

manner, but the strong link between accounting and taxing aspects in Spain led to a deep review of both legislations.

The wider application of IFRS took place in 2007, through the Law 16/2007 of 4 July, which included substantial changes in the Commercial Code 1885 and the Public Companies Act of 1989. IFRS were adapted under a structured form that was similar to the former PGC of 1990. Finally, the NPGC[13] for large companies and a different plan for small and medium companies,[14] both approved in 2007, represented the current legal instruments under which the Spanish government adapted IFRS for statements other than consolidated financial statements of listed companies, starting from the year beginning after 1 January 2008.

4.2.2. Audit market in Spain

In Spain, as in most countries, the audit market is heavily concentrated in the hands of the Big 4[15] (Carrera et al., 2005); therefore, before analysing the behaviour of the audit prices for the listed companies, it is helpful to shed some light on the price behaviour for the whole audit market.

The data presented in Table 4.1 show the evolution, in real terms, of the average fee per hour of the audit services carried out for all types of annual accounts (consolidated and individual) and supervisions (legal and voluntary). In real prices, the average audit fee per hour in 2003 was approximately 56 euros for audit firms and 48 euros for individual auditors. Meanwhile, in 2009 (six years later), it only increased by one euro, up to 57 euros and 49 euros, respectively.

[13] Approved through RD 1514/2007 de 16 de Noviembre.

[14] Approved through RD 1515/2007 de 16 de Noviembre.

[15] In 2011, 70% of the total audit turnover was supervised by the seven largest audit firms (BOICAC, 90, June 2012, p. 85).

Table 4.1. Audit fees in the Spanish audit market in 2003-2009. Data in constant euros

	2003	2004	2005	2006	2007	2008	2009
Audit firms							
Average fee per hour	55.9	53.7	58.0	57.3	56.8	58.1	57.3
Growth rate of average fee per hour		-3.9%	7.9%	-1.1%	-0.9%	2.3%	-1.3%
Cumulative growth rate		-3.9%	4.0%	2.9%	2.0%	4.3%	3.0%
Individual auditors							
Average fee per hour	48.0	47.1	47.3	47.4	50.4	49.0	49.1
Growth rate of average fee per hour		-1.9%	0.3%	0.2%	6.3%	-2.7%	0.3%
Cumulative growth rate		-1.9%	-1.6%	-1.4%	4.9%	2.2%	2.5%

Source: Spanish Institute of Accounting and Auditing Bulletin (BOICAC nº 58, 62,66,70,74,78,82)
Constant euros based in 2003 according to the IPC index 1996

In all, the cumulative growth rate for audit firms during 2003–2009 was 3.0% and for individual auditors 2.5%, but during the period of analysis, the price bumbles. Therefore, it is arguable that the oligopolistic structure of the audit market in Spain (according to Rodriguez and Ruiz Barbadillo, 2014) does not seem to drive up the prices of the audit services. Rather, the prices seem to suffer due to the severe competition among the audit players.

This Spanish price track differs from the continuous growth periods documented in other countries. The Oxera report (2006) revealed that, in the UK, between 2000 and 2004, the audit fees growth rate was higher than 11.7% per year in real terms. Those results were corroborated, for quoted UK companies, by Abidin et al. (2010), but these authors emphasised that reported upward pressure on audit fees from 2001 to 2003 was experienced mainly by the smallest auditees. Other studies (Griffin et al., 2009; Salman and Carson, 2009) evidenced high growth rates during similar periods of time.

A deeper look into the individual years reveals that the growth rate of audit firms' fees exhibit negative figures except for 2005 and 2008, our target years, when the new accounting regimes took place. The prices of the individual auditors present a growing rate that is either negative or very low except for the year 2007.

Nevertheless, further insight into the quoted companies is needed because the evolution of the global magnitude might conceal different tracks from different

(individual vs. consolidated accounts and voluntary vs. compulsory) audit works. The study of the quoted companies sample allows us to address the impact of both stages of IFRS implementation.

4.3. Literature review and research questions

4.3.1. The impact of regulatory changes on audit fees

Archival literature shows that auditing and accounting regulatory changes have resulted in significant increases in audit fees. Regarding auditing, Menon and Williams (2001) reported that the most significant increment of audit fees along almost two decades (1979–1997) was the consequence of the set of auditing rules known as "expectation gap rules" issued by the Auditing Standards Board in 1988. In the following years, Griffin and Lont (2007), Salman and Carson (2009) or De Fuentes and Sierra (2015) also documented the positive pressure on audit fees of a strict audit regulation such as U.S. House of Representatives (2002). In the same vein, the Oxera Report identified high growth rates of audit fees for the period 2000–2004 in the UK, which were likely due to "changes in regulation and accounting rules" (Oxera, 2006, p. 5).

Regarding accounting, the IFRS represented a major change in reporting financial statements compared with the former accounting regulation in many European countries, although a high degree of heterogeneity in accounting practices among EU members remained despite the harmonisation process initiated with the 4th, 7th and 8th Directives (Jarne et al., 2003).

In Spain, Gonzalo-Angulo (2014), the former ICAC president, provided an in-depth review of the process and the main forces behind the accounting reforms between 2000 and 2010 from an insider's perspective. Regarding the consolidated accounts of listed entities, Gonzalo-Angulo (2014) identified, among other changes, those related to the perimeter of consolidation, the goodwill valuation and

deterioration test or the use of the reasonable value. In addition, as stated by Carmona and Trombetta (2008), under the IFRS principles-based system, accountants and auditors need to make a considerable number of estimates and require a deeper understanding of the company environment to issue a professional judgement about the proper application of IFRS. New accounting estimates are related to, for instance, the future cash flows within the valuation process of many financial assets or the funds to perform environmental restoration or rehabilitation. In addition, new disclosures and statements are required, such as a statement of cash flow.

In short, the domestic accounting standards differed greatly from the international standards (Gonzalo-Angulo, 2014), especially for the larger companies that must undergo statutory audit, whose differences in current assets or equity valuation lead to significant changes in financial ratios, such as the liquidity or debt ratio (Bae et al., 2008; Callao et al., 2010; Callao et al., 2007).

Moreover, Ding et al. (2007) quantified the differences between domestic and international accounting standards in a sample of 30 countries through the estimation of two indices. The first index, labelled divergence, measured the differences in the rules regarding the same accounting issue. The second index, labelled absence, measured the accounting issues that were not covered in the national standards but were covered in the international standards. These researchers concluded that Spanish accounting standards greatly differed from IFRS because they presented a high level of either divergence or absence.

Thus, overall, the national GAAP differed greatly from other Member States' accounting standards in the period prior to the adoption of IFRS and differed from the international standards adopted by the EU.

The consequence of those important changes in accounting regulation for audit fees might arise from different sources. On the one hand, it is plausible to predict that auditors' investment in knowledge acquisition of international standards would have increased their costs; thus, they would have tried to recover this investment

through higher audit prices. On the other hand, the IFRS implementation would raise the inherent risk of the financial statements and, consequently, the audit risk (Vieru and Shadewitz, 2010). Moreover, the International Auditing and Assurance Standard Board disclosures refer to assessments of the risk of material misstatement, including "Risks that require special audit considerations":

"In exercising judgment as to which risks are significant risks, the auditor shall consider at least the following:

...(b) Whether the risk is related to recent significant economic, accounting or other developments and, therefore, requires specific attention... (IFAC 2013, International Standard on Auditing revised, p. 275)"

Although the empirical evidence on this issue is scarce, Griffin et al. (2009) and Vieru and Shadewitz (2010) reported a positive association between the new accounting regulation and audit fees. Kim et al. (2012) extended the scope to 14 countries and concluded that, for the whole sample, the increases in audit fees identified for the 2005–2008 period are associated with the implementation of IFRS. They also concluded that fee premiums increase with the increase in audit complexity and decrease with the improvement in financial reporting quality.

Therefore, and according to prior evidence, we expect that audit fees will rise around the implementation period of IFRS, which greatly differed from the prior national accounting rules in Spain. Consequently, we pose the following research questions:

RQ1a: Is there any unexpected increase in the audit fees that could be related to the adoption of IFRS to deliver consolidated financial statements by listed companies in 2005?

RQ1b: Is there any unexpected increase in the audit fees that could be related to the implementation of the adapted IFRS (NPGC) to deliver individual financial statements by listed companies in 2008?

4.3.2. The impact of regulatory changes on non-audit fees

Two regulatory reforms might affect the evolution of consultancy services provided by the same auditing group along the first decade of the century, namely the set of rules related to auditors' independence included in the Financial Act in 2002 and the IFRS implementation in 2005 and 2008.

The aftermath of the Enron scandal resulted in the Sarbanes Oxley Act (2002) and international political pressure to restrict an auditing firm's provision of additional services because it increases the economic weight of the client on the auditor's portfolio and jeopardises the auditor's independence (a literature review on this topic is provided by Schneider et al., 2006). In this regard, Ghosh and Pawlewicz (2009) and Griffin et al. (2009) documented a significant decrease in the additional services provided by the same auditing group. In the same vein, Abidin et al. (2010) observed a lower level of non-audit services in the year of change to a new auditor during the 2001–2003 period. As Diehl (2010) stated, those trends may reflect the auditors' pressure to avoid signalling an excessive economic bond, according to the atmosphere created by U.S. House of Representatives (2002).

Conversely, the adoption of IFRS might have accomplished a higher demand of consultancy services, but the empirical evidence provides mixed results. Vieru and Shadewitz (2010) found that the implementation of IFRS in Finland generated an increase in consultancy rather than in audit fees; Griffin et al. (2009) reported a significant decrease in non-audit fees surrounding the IFRS adoption period in the New Zealand audit market; and Diehl (2010) failed to find a significant association.

To formulate our research questions, we need to identify those auditors' independence and accounting regulatory changes in the Spanish setting because they can both influence the trend in non-audit fees.

In the auditing field, the Financial Act in 2002 was the vehicle that constrained the amount and type of additional services that could be provided by an auditing group, following the international trend. In particular, article 51 introduced a set of incompatibilities such as bookkeeping and the financial valuation with a high degree of subjectivity. Other services such as the design of IT systems and internal auditing needed to comply with certain conditions. Mostly, the independence safeguards refer to the auditor, i.e., the statutory auditor who signs the audit report and the audit firm to which he or she belongs, rather than to the auditing group.

Although empirical evidence in other countries demonstrates mixed results, according to the KPMG Auditores survey (2010), Spanish companies sought external consultancy services to adjust either their accounting policies or staff training. Therefore, we formulate the second set of research questions in the following form:

RQ2a: Is there an unexpected increase in the non-audit fees that could be related to the adoption of IFRS to deliver consolidated financial statements by listed companies in 2005?

RQ2b: Is there an unexpected increase in the non-audit fees that could be related to the implementation of the adapted IFRS (NPGC) to deliver individual financial statements by listed companies in 2008?

4.4. Research design

4.4.1. Sample

To construct our sample, we obtain financial data between 2003 and 2009 for Spanish listed companies from the SABI[16] database. We manually collect annual audit and consultancy fees from the footnote disclosures of the financial statements filed with the CNMV.[17]

Initially, our sample consisted of 909 firm-year observations for consolidated financial statements and 1015 firm-year observations for individual financial statements. We do not include finance and insurance companies because prior research shows that the determinants of audit fees are unique for such companies (Fields et al., 2004; Simunic, 1980). We also exclude firms with missing information on our research variables. As a result, our sample was reduced to 739 observations for consolidated financial statements and 706 observations for individual financial statements.

In addition, we drop five groups and two parent companies that have different fiscal year ends and do not follow the same timing of accounting changes.[18] In all, our samples include 90 listed groups and 88 parent companies. Of the groups, 84 have a parent company whose financial accounts are in the individual financial statement sample. However, that is not the case for all the companies. A total of six groups do not have a parent company with the required characteristics. Furthermore, four listed companies are included in the individual sample but not in the consolidated sample. Observations are fairly evenly distributed across the years.

[16] SABI: Sistema de Análisis de Balances Ibéricos. In English, Balance Sheet Analysis System for Iberian Companies.

[17] CNMV: Comisión Nacional del Mercado de Valores, in English, National Securities Exchange Commission (CNMV).

[18] The first year of the application of IFRS for the consolidated statements of five groups (two parent companies) was 2006 or 2007 (2009).

Finally, because we are interested in tracking real rather than nominal fees, to avoid the movements of the general price of goods and services, we deflate all monetary data included in this study. We consider December 2003 as the base period and apply the Consumer Price Index with the reference base in 2006.[19]

4.4.2. Method and models

We calculate the IFRS/NPGC premium included in the audit fee as the difference between the actual audit fee paid due to IFRS/NPGC implementation and the predicted audit fee that would have been paid had the IFRS/NPGC not been adopted (as in Menon and Williams, 2001 or Carson et al., 2012).

The predicted audit fee is derived from estimating an audit fee model using OLS for 2003, a pre-IFRS year. Using this fee expectations model, we predict the audit and non-audit fee for each firm for each year from 2004 to 2009. We follow the same process to estimate the IFRS/NPGC additional price included in non-audit fees.

4.4.2.1. Fee models

We build an audit fee model that is similar to the seminal model developed by Simunic (1980), which includes fee determinants that control for auditee size, audit risk and complexity (Causholly et al., 2010; Craswell et al, 1995; Hay et al., 2006a or Hay, 2013) and has been successfully applied in the Spanish context by, among others, Carmona and Momparler (2011) and Serrano et al. (2013).

Therefore, we first estimate the following audit fee model in 2003:

[19] http://www.ine.es

4.4.2.1.1. Audit fee model

$$LAF = \alpha + LNAF + \sum_{k=1}^{10} \delta_K FSCONTROL + \sum_{J=1}^{5} \varphi_J IND + \varepsilon$$

Where:

LAF = Natural log of audit fees
LNAF = Natural log of non-audit fees
LTA = Natural log of auditees' total assets (+)
INVARAT = Inventory and receivables divided by total assets (+)
ROA = Return on assets, defined as net income divided by total assets (-)
LOSS = Equal to 1 if the company reports a negative net income in the current fiscal year, 0 otherwise (+)
DTA = Total debt divided by total assets (+)
QUICK =Quick ratio, defined as current assets minus inventory divided by current liabilities (-)
BIG4 = Equal to 1 if the auditor is a member of the Big 4, 0 otherwise (+)
AUDCHG = Indicator variable equal to 1 if there has been an auditor change, 0 otherwise (+)
LAG = Natural log of the number of days between current fiscal year end and the issuance of the audit report (+)
DUAL = Indicator variable equal to 1 if the company quotes on the Nasdaq, the OMX Europe, the NYSE or the LSE, 0 otherwise (+)
IND = Vector of dichotomous variables that represents the company´s industry sector. We define this vector as follows: *IND D* Manufacturing (SIC codes 20-39), *IND E* Transport and Public Utilities (SIC codes 40-49), *IND F/G* Wholesale and Retail Trade (SIC codes 50-59), *IND H* Real Estate (SIC code 65), *IND I* Services (SIC codes 70-89). These indicators are equal to 1 if the company is classified within an industry sector (0 otherwise). We use agricultural and construction sectors, labelled *IND B/C* (SIC codes 01-17), as our base references.
ε = Error term

The dependent variables are, respectively, audit and consultancy fees satisfied by listed groups and parent companies. Traditionally, the dependent variables are estimated in natural log form to reduce variability and obtain more robust results. Following prior research, we consider both audit and non-audit fees as explanatory variables, but we cannot fully predict the sign of the coefficient because the archival

literature offers a variety of possibilities, including statistically significant and positive (Davis et al., 1993; Palmrose, 1986b; Simunic, 1980 or Bell et al., 2001) and not significant (Abdel-Khalik, 1990; O'Keefe et al., 1994; Stein et al., 1994 or Firth, 1997).

The audit/non-audit fee model employed in this study also captures the primary fee drivers derived from prior audit/consultancy services research (Hay et al., 2006; Simunic, 1980 or Hay, 2013).

The size of the auditee company is a widely tested explanatory variable and, according to Hay et al. (2006), it typically explains more than 70% of the variation in audit fees. We calculate the natural logarithm form of the total assets (LTA) to reduce variability and skewness (Mayhew and Wilkins, 2003; Menon and Williams, 2001; Palmrose, 1986b; Simon and Francis, 1988; Taylor and Simon, 1999 or Carson and Fargher, 2007; Casterella et al., 2004; among others). We expect a positive association with audit fees.

The combination of inventory and receivables divided by total assets (INVARAT) seems to be the best proxy of inherent risk (Hay et al., 2006a) and is a common driver of auditors' effort (Charles et al., 2010; Choi et al., 2010; Huang et al., 2009). According to prior results, we expect a positive relationship with audit fees.

We also include several determinants of the company's inherent risk such as profitability, leverage and liquidity, which are measured as the return on assets ratio, ROA, the leverage ratio, DTA, and the quick ratio, QUICK, respectively. Following prior methodologies (Carson et al., 2004; Casterella et al., 2004), we control for financial risk using a dichotomous variable, labelled LOSS, which observes whether the company reports a negative net income in the current fiscal year. Prior literature does not offer consistent results; thus, we cannot fully predict the sign of those coefficients. Nevertheless, we expect a positive association between audit fees and the leverage ratio but a negative association between audit fees and the quick ratio (Hay et al., 2006a).

We add a variable, DUAL, that shows whether a company is listed on the main international stock exchanges, such as Nasdaq, the OMX Europe, the NYSE or the LSE (Griffin et al., 2009), because the regulatory bodies of the capital markets typically require additional disclosures of financial information that increase the complexity of the audit process. We expect a positive association with our variables of interest.

We consider the number of days between the current fiscal year end and the issuance of the audit report, labelled LAG, to capture additional audit efforts.

We include variables that are related to auditors' characteristics that may influence the level of audit fees, such as the dichotomous variable labelled BIG4, to address the price premium (if any) associated with the auditors' reputation (Francis and Simon, 1987; Gul et al., 2003; Hay et al., 2006a; Carson et al., 2004 or 2012). By contrast, archival literature documents the *price discount* or *lowballing* related to the new auditor (Pearson and Trompeter, 1994; Simon and Francis, 1988 or Walker and Casterella, 2000); thus, the variable labelled AUDCHG captures whether there is an auditor change.

4.4.2.1.2. Non-audit fee model

As in the archival literature (DeFond et al., 2002; Griffin et al., 2009; Whisenant et al., 2003), we incorporate the same set of firm-specific control variables as the audit fee model except for LAG because it was not significant in prior works.

Therefore, we estimate the following non-audit fee model:

$$LNAF = \alpha + LAF + \sum_{k=1}^{9} \delta_K FSCONTROL + \sum_{J=1}^{5} \varphi_J IND + \varepsilon$$

4.4.2.1.3. Total fee model

The boundaries between audit and consultancy services remain a matter of research interest. Some studies find a bilateral and positive influence (Antle et al., 2006; Stein, 2006 or McMeeking et al., 2007), supporting the flows of knowledge between the two services (in Spain, Monterrey and Sanchez-Segura, 2007 or de Fuentes and Pucheta-Martinez, 2009). Thus, a decrease/increase in consultancy services might be balanced with an increase/decrease in audit services such as the total amount of fees is not outstandingly altered. To address this issue, we examine the behaviour of total audit and non-audit fees (TANAF) in its natural log form. This model includes the same variables than the audit fee model does.

$$TANAF = \alpha + \sum_{k=1}^{9} \delta_K \, FSCONTROL + \sum_{J=1}^{5} \varphi_J \, IND + \varepsilon$$

4.4.2.2. IFRS/NPGC premium estimation

The above-mentioned models are the fee expectation models that use 2003, a pre-IFRS period, as the benchmark. Following Menon and Williams (2001), we use this model to predict the fees for each firm for each year from 2004 to 2009 as if the accounting reforms had not taken place. We consider the IFRS/NPGC premium as a percentage calculated as follows[20]:

$$exp\big(LAF - \mathrm{E}(LAF|IFRS\,/\,NPGC = 0)\big) - 1$$

where LAF is the log of the actual fee paid and $\mathrm{E}(\mathrm{LAF}|\mathrm{IFRS}/\mathrm{NPGC} = 0)$ is the predicted log fee using the 2003 model as the fee expectation model. This formula measures the greater (lower) percentage of the fee paid with regard to the expected

[20] To calculate the IFRS/NPGC premium, we winsorise all continuous variables at the top and bottom 1%

fee and is equivalent to calculating the difference between the actual audit fees (*IFRS/NPGC audit fee*) and the predicted values (*PAFEE*) and dividing the resulting value by the predicted fees.

$$AF\ IFRS\ /\ NPGC\ premium = \ (IFRS\ /\ NPGCauditfee - PAFEE)/(PAFEE)$$

and we use the same formula for non-audit fees:

$$exp\big(LNAF - \mathrm{E}(LNAF|IFRS\ /\ NPGC = 0)\big) - 1$$

which simplifies the IFRS/NPGC premium for non-audit fees:

$$NAF\ IFRS\ /\ NPGC\ premium = \ (IFRS\ /\ NPGCnonauditfee - PNAFEE)/(PNAFEE)$$

If the fee changes only in proportion to changes in levels of the independent variables in the audit fee model, then the prediction error should not be significantly different from zero. Positive or negative prediction errors in a given year (*PAFEE* or *PNAFEE*) indicate that actual fees have increased or declined in relation to the expected values according to the 2003 model, after controlling for changes in the levels of independent variables, i.e., non-zero values capture the cumulative effects of changes in pricing.

Similar methodology was followed to estimate total fees premia.

4.5. Results

4.5.1. Descriptive statistics

Descriptive statistics are shown in Table 4.2 for consolidated financial statements. We report audit fees and non-audit fees in constant euros before log transformations to better represent their overall composition. As Tables 4.2 and 4.3

show, mean and median values of audit fees are higher than those reported for non-audit fees. Mean audit fees increase from 644 in 2003 to 1323 thousand euros in 2009. For the sake of comparability, we estimate the CRG in every year, and our figures are higher than those reported by Griffin et al. (2009) in New Zealand. In particular, for the whole period, CRG is 14.65%, with the sharpest rise in 2005, where audit fees accentuated their growth rate from 8.54% to 17.30%. This change coincides with the first year of adoption of IFRS. We also estimate the compound annual growth rate (CAGR), which smoothens the growth rate during that period, raising it at a rate of 12.77% between 2003 and 2009.

Mean non-audit fees experience a 0.29% decrease in 2004, but the fees shift to the positive direction in 2005 and keep this sign along the following years. In fact, although lower than the CRG of audit fees, the average for the whole period is high, 11.01%, compared to the negative growth rates reported by Griffin et al. (2009) for 2002–2006 in New Zealand. On average, for the whole period, we estimate that non-audit fees account for 23.12% of the total annual audit and non-audit revenues (mean NAF/TF), such as Monterrey and Sanchez-Segura (2007) and similar to the percentage reported in New Zealand (29%) (Griffin et al., 2009).

We also present the total audit and non-audit fees because some authors argue that the two services are complementary and that the transfer of knowledge occurs in the transfer of services. Not surprisingly, the average constant growth rate is 13.37%, a value that is located between the audit and non-audit fee rates.

Table 4.2. Descriptive statistics for audit fees, non-audit fees and control variables. Consolidated financial statements

Panel A: Audit fees (AF) and non-audit fees (NAF) by year (thousand €s). Monetary data in constant euros								
Year	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**TOTAL**
Audit fees	(N=85)	(N=90)	(N=90)	(N=90)	(N=90)	(N=90)	(N=90)	(N=625)
Mean	644	698	885	1 118	1 312	1 319	1 323	1 046
Median	206	192	223	381	358	467	417	276
Std.	1 293	1 489	1 928	2 782	2 880	2 771	2 788	2 375
CRG in mean		8.54%	17.30%	20.86%	20.87%	17.73%	14.65%	14.65%
CAGR								12.77%
Non-audit fees	(N=85)	(N=90)	(N=90)	(N=90)	(N=90)	(N=90)	(N=90)	(N=625)
Mean	397	396	422	662	603	587	720	542
Median	58	53	98	87	94	154	131	90
Std.	1 546	1 399	1 499	3 021	1 939	1 673	2 201	1 966
CRG in mean		-0.29%	3.08%	17.27%	14.41%	11.01%	11.01%	11.01%
CAGR								10.41%
Mean NAF/Total fees (%)	22.11	22.98	25.17	23.06	20.88	23.80	23.81	23.12
Total Audit and Non-Audit fees								
CRG in mean		5.17%	12.08%	19.57%	18.59%	15.39%	13.37%	13.37%
CAGR								11.90%

Note: CRG, constant rate of growth; CAGR, compound annual growth rate.

Table 4.3 shows a descriptive analytical summary of the remaining variables. The Big 4 market is approximately 90%. However, 7% of the samples change their auditor over the period of analysis. According to the sample distribution by industry, manufacturing (IND *D*) represents 36% of the sample. There are no important differences between industries. Specifically, transport and public utilities industries (IND *E*) and services (IND *I*) account for around 20% of the sample, followed by agricultural and construction industries (IND *B/C*), with 14%. Our sample has lower proportions of wholesale and retail trade industries (INF *F/G*) and real estate companies (IND *H*), 4% and 6%, respectively.

In the case of parent companies, Table 4.4 sheds light on how audit fees and non-audit fees behave throughout the seven-year period. The absolute values are much lower than the records in the notes of the consolidated statements, reflecting the lower audit complexity and risk. The growing rates throughout the whole period are lower than those related to the supervision of group accounts. Mean audit fees increases at a constant rate of 12.78%, although a detailed analysis allows us to appreciate a progressive reduction in this growth from 2006. We note that the growth rate falls from 20.06% to 12.78% during the period from 2006 to 2009. The mean consultancy fees only increase 1.77%, showing, once again, a negative sign in 2004. Overall, parent companies seem to demand more consultancy services than the group that they belong to, as they account for 28.15% of the total bill.

In global terms, audit and non-audit fees show clear increases in 2005 and 2006, the post-IFRS period, with 9.42% and 14.41% growth rates.

Table 4.5 provides descriptive statistics for the variables related with individual financial statements. In general, because all listed groups whose parent companies are in the individual financial statement sample (84 out of a total of 90 listed groups) are audited by the same audit firm, the descriptive statistics from both samples exhibit clear parallelism, i.e., Big 4 companies audit approximately 88% of the sample and 8% of companies change their auditor firm. Similar comments

concerning the values exhibited by the group accounts can also be made for the remaining variables.

Table 4.3. Descriptive statistics. Consolidated financial statements. Data in constant euros

Panel B. Control variables							
Variable	Mean	Median	Min	Max	Std	25%	75%
LAF	5.771	5.621	0	10.029	1.506	4.556	6.854
LNAF	3.976	4.504	-0.478	10.254	2.582	2.047	5.938
LTA	13.750	13.608	9.936	18.412	1.831	12.316	15.020
INVARAT	0.311	0.290	0.000	0.747	0.178	0.174	0.442
ROA	0.060	0.055	-0.306	0.472	0.076	0.029	0.089
DTA	0.606	0.625	0.046	1.255	0.179	0.496	0.732
QUICK	1.006	0.871	0.047	13.997	0.774	0.683	1.119
LAG	4.390	4.488	2.995	6.127	0.300	4.094	4.533
LOSS	0.118						
BIG4	0.899						
DUAL	0.428						
AUDCHG	0.072						
IND B/C	0.144						
IND D	0.358						
IND E	0.211						
IND F/G	0.043						
IND H	0.056						
IND I	0.187						

Notes: Variable definitions: *LAF* , natural log of audit fees; *LNAF* , natural log of non-audit fees; *LTA* , natural log of total assets; *INVARAT* , inventory and receivables divided by total assets; *ROA* , return on assets, defined as net income divided by total assets; *DTA* , total debt divided by total assets; *QUICK* , current assets minus inventory divided by current liabilities; *LAG* , natural log of the number of days between current fiscal year end and the issuance of the audit report; *LOSS* , indicator variable equal to 1 if the company reports a negative net income in the current fiscal year (0 otherwise); *BIG4* , indicator variable equal to 1 if the auditor is a member of the Big 4 (0 otherwise); *DUAL* , indicator variable equal to 1 if the company quotes on the Nasdaq, the OMX Europe, the NYSE or the LSE (0 otherwise); *AUDCHG* , indicator variable equal to 1 if there has been an auditor change (0 otherwise); *IND B/C* , Agricultural and construction sector (SIC codes 01–17); *IND D* , manufacturing (SIC codes 20–39); *IND E* , transport and public utilities (SIC codes 40–49); *IND F/G* , wholesale and retail trade (SIC codes 50–59); *IND H* , real estate (SIC codes: 65*); IND I* , services (SIC codes: 70–89).

4.5.2. Correlation analysis

We report our correlation matrices for the audit and non-audit fee models (Tables 4.6 and 4.7, Panels A and B). Consistent with prior studies, for both group and individual accounts, the client size, measured as the natural log of total assets (LTA), is positively and highly correlated with the natural log of the audit fees (LAF); the coefficients are 0.835 and 0.745, respectively. They exhibit the same association with the consultancy fees reported in the group and individual accounts, with LTA-LNAF coefficients of 0.668 and 0.592, respectively. Additionally, we observe a high correlation between audit and consultancy fees. With the exception of the coefficient between LOSS and ROA, and INVARAT and LTA (0.441) for consolidated statements, the remaining coefficients are below 0.4.

Table 4.4. Descriptive statistics for audit fees and non-audit fees. Individual financial statements

Panel A: Audit fees (AF) and non-audit fees (NAF) by year (thousand €s). Monetary data in constant euros.								
Year	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**TOTAL**
Audit fees	(N=85)	(N=88)	(N=88)	(N=88)	(N=88)	(N=88)	(N=87)	(N=612)
Mean	133	140	184	223	227	260	252	203
Median	57	56	61	74	79	92	97	70
Std.	224	324	457	620	347 690	640	548	526
CRG in mean		5.04%	17.80%	20.06%	16.64%	15.35%	12.78%	12.78%
CAGR								11.24%
Non-audit fees	(N=85)	(N=88)	(N=88)	(N=88)	(N=88)	(N=88)	(N=87)	(N=612)
Mean	129	125	129	165	158	157	143	144
Median	8	18	37	16	14	40	41	24
Std.	332	283	253	383	415	334	216	322
CRG in mean		-2.45%	0.02%	7.97%	7.11%	5.72%	3.54%	3.54%
CAGR								1.77%
Mean NAF/Total fees (%)	24.96	29.95	32.47	25.91	24.77	29.46	29.43	28.15
Total Audit and Non-Audit fees								
CRG in mean		1.36%	9.42%	14.41%	12.25%	11.05%	8.75%	8.75%
CAGR								7.11%

Notes: CRG, constant rate of growth; CAGR, compound annual growth rate.

Table 4.5. Descriptive statistics. Individual financial statements. Data in constant euros

Panel B. Control variables

Variable	Mean	Median	Min	Max	Std	25%	75%
LAF	4.386	4.253	0.661	8.694	1.183	3.606	5.076
LNAF	2.814	3.176	-2.283	7.903	2.450	0	4.936
LTA	13.078	12.804	9.563	18.148	1.742	11.782	14.318
INVARAT	0.217	0.161	-0.175	1.074	0.208	0.031	0.360
ROA	0.039	0.028	-0.174	0.356	0.069	-0.003	0.069
DTA	0.524	0.534	0.021	1.529	0.225	0.370	0.697
QUICK	2.643	0.914	-0.026	474.333	21.221	0.589	1.388
LAG	4.402	4.489	2.996	5.659	0.294	4.094	4.543
LOSS	0.175						
BIG4	0.884						
DUAL	0.225						
AUDCHG	0.078						
IND B/C	0.126						
IND D	0.376						
IND E	0.194						
IND F/G	0.044						
IND H	0.080						
IND I	0.180						

Notes: Variable definitions: *LAF* , natural log of audit fees; *LNAF* , natural log of non-audit fees; *LTA* , natural log of total assets; *INVARAT* , inventory and receivables divided by total assets; *ROA* , return on assets, defined as net income divided by total assets; *DTA* , total debt divided by total assets; *QUICK* , current assets minus inventory divided by current liabilities; *LAG* , natural log of the number of days between current fiscal year end and the issuance of the audit report; *LOSS* , indicator variable equal to 1 if the company reports a negative net income in the current fiscal year (0 otherwise); *BIG4* , indicator variable equal to 1 if the auditor is a member of the Big 4 (0 otherwise); *DUAL* , indicator variable equal to 1 if the company quotes on the Nasdaq, the OMX Europe, the NYSE or the LSE (0 otherwise); *AUDCHG* , indicator variable equal to 1 if there has been an auditor change (0 otherwise); *IND B/C* , Agricultural and construction sector (SIC codes 01–17); *IND D* , manufacturing (SIC codes 20–39); *IND E* , transport and public utilities (SIC codes 40–49); *IND F/G* , wholesale and retail trade (SIC codes 50–59); *IND H* , real estate (SIC codes: 65); *IND I* , services (SIC codes: 70–89).

Table 4.6. Pairwise Correlation Coefficients

Panel A. Consolidated Financial Statements.

	LAF	*LNAF*	*LTA*	*INVARAT*	*ROA*	*LOSS*	*DTA*	*QUICK*	*BIG4*
LNAF	0.763***								
LTA	0.835***	0.669***							
INVARAT	-0.306***	-0.308***	-0.441***						
ROA	0.101*	0.090*	0.142***	0.101*					
LOSS	-0.065	-0.029	-0.155***	-0.002	-0.513***				
DTA	0.331***	0.319***	0.348***	0.029	-0.188***	0.125**			
QUICK	-0.132**	-0.089*	-0.147***	-0.101*	0.024	-0.065	-0.322***		
BIG4	0.303***	0.309***	0.261***	0.068+	0.196***	-0.091*	0.063	-0.164***	
AUDCH	-0.114**	-0.120**	-0.056	-0.024	-0.021	0.032	-0.022	-0.011	-0.133***
LAG	-0.321***	-0.296***	-0.359***	0.094*	-0.229***	0.024	-0.073+	0.090*	-0.219***
DUAL	0.243***	0.249***	0.339***	-0.073+	0.073+	-0.080*	0.231***	-0.004	0.102*
INDB/C	0.234***	0.139***	0.303***	-0.025	-0.059	-0.052	0.255***	-0.023	-0.060
INDD	-0.260***	-0.191***	-0.352***	0.366***	-0.073+	0.119**	-0.230***	-0.101*	-0.027
INDE	0.151***	0.196***	0.287***	-0.280***	0.140***	-0.080*	0.170***	0.080*	0.017
INDF/G	0.059	-0.059	0.005	-0.002	0.206***	-0.078+	-0.161***	0.040	-0.112**
INDH	-0.204***	-0.195***	0.008	-0.095*	-0.041	-0.025	-0.114**	-0.024	0.082*
INDI	0.041	0.050	-0.148***	-0.078+	-0.086*	0.040	0.027	0.055	0.079*

Statistical significance based on two-tailed tests. Test of significance: *** < 0.001, ** < 0.01, * <0.05, + <0.10.

Panel B. Consolidated Financial Statements (Cont.).

	AUDCH	*LAG*	*DUAL*	*IND B/C*	*IND D*	*IND E*	*IND F/G*	*IND H*
LAG	0.050							
DUAL	-0.013	-0.071+						
INDBC	0.009	0.052	0.141***					
INDD	0.024	0.094*	-0.258***	-0.307***				
INDE	0.008	-0.200***	0.148***	-0.212***	-0.387***			
INDFG	-0.029	-0.092*	-0.010	-0.087*	-0.159***	-0.110**		
INDH	0.013	0.040	-0.138***	-0.100*	-0.182***	-0.126**	-0.052	
INDI	-0.039	0.071+	0.122**	-0.197***	-0.359***	-0.248***	-0.102*	-0.117**

Statistical significance based on two-tailed tests. Test of significance: *** < 0.001, ** < 0.01, * <0.05, + <0.10

Variable definitions: *LAF*: natural log of audit fees; *LNAF*: natural log of non-audit fees; *LTA*: natural log of total assets; *INVARAT*: inventory and receivables divided by total assets; *ROA*: Return on assets, defined as net income divided by total assets; *LOSS*: Indicator variable equal to 1 if the company reports a negative net income in the current fiscal year (0 otherwise); *DTA*: Total debt divided by total assets; *QUICK*: current assets minus inventory divided by current liabilities; *BIG4*: Indicator variable equal to 1 whether the auditor is a member of the Big 4 (0 otherwise); *AUDCHG*: Indicator variable equal to 1 if there has been an auditor change (0 otherwise); *LAG*: natural log of the number of days between current fiscal year end and the issuance of the audit report ; *DUAL*: Indicator variable equal to 1 if the company quotes on the Nasdaq, the OMX Europe, the NYSE or the LSE (0 otherwise); IND B/C: agricultural and construction sector (SIC codes 01-17); IND D: manufacturing (SIC codes 20-39) ; *IND E*: transport and public utilities (SIC codes 40-49) ; *IND F/G*: wholesale and retail trade (SIC codes 50-59); *IND H*: real estate (SIC codes: 65); *IND I*: services (SIC codes: 70-89).

Table 4.7. Pairwise Correlation Coefficients

Panel A. Individual Financial Statements.

	LAF	*LNAF*	*LTA*	*INVARAT*	*ROA*	*LOSS*	*DTA*	*QUICK*	*BIG4*
LNAF	0.540***								
LTA	0.745***	0.592***							
INVARAT	-0.047	-0.191***	-0.225***						
ROA	0.014	0.017	0.023	0.247***					
LOSS	-0.073+	-0.089*	-0.163***	-0.111**	-0.328***				
DTA	0.197***	0.260***	0.303***	0.232***	0.012	0.072+			
QUICK	-0.071+	-0.074+	-0.076+	-0.059	-0.056	-0.017	-0.143***		
BIG4	0.346***	0.301***	0.306***	0.067+	0.125**	-0.142***	0.096*	-0.165***	
AUDCH	-0.107**	-0.125**	-0.063	-0.033	-0.037	0.074+	-0.023	-0.019	-0.160***
LAG	-0.313***	-0.297***	-0.398***	0.065	-0.151***	0.137***	-0.107**	0.026	-0.240***
DUAL	0.251***	0.258***	0.336***	-0.107**	0.074+	-0.176***	0.121**	-0.031	0.110**
INDB/C	0.027	0.102*	0.194***	-0.077+	-0.077+	-0.084*	0.120**	-0.025	-0.078+
INDD	-0.120**	-0.234***	-0.274***	0.229***	-0.052	0.078+	-0.175***	-0.051	0.018
INDE	0.229***	0.301***	0.330***	-0.074+	0.142***	-0.118**	0.091*	0.118**	0.023
INDF/G	0.079+	-0.001	0.018	0.084*	0.161***	-0.099*	-0.060	-0.013	-0.096*
INDH	-0.200***	-0.218***	-0.068+	-0.077+	0.053	0.039	-0.044	-0.022	-0.025
INDI	-0.008	0.051	-0.123**	-0.137***	-0.138***	0.121**	0.087*	-0.013	0.090*

Section 4.2 for variable definitions. Statistical significance based on two-tailed tests. Test of significance: *** < 0.001, ** < 0.01, * <0.05, + <0.10.

Panel B. Individual Financial Statements (Cont.)

	AUDCH	*LAG*	*DUAL*	*IND B/C*	*IND D*	*IND E*	*IND F/G*	*INDH*
LAG	0.075+							
DUAL	0.017	-0.172***						
INDB/C	0.036	0.058	0.043					
INDD	-0.001	0.101*	-0.249***	-0.294***				
INDE	0.010	-0.249***	0.150***	-0.186***	-0.381***			
INDF/G	-0.033	-0.105**	0.132**	-0.082*	-0.167***	-0.106**		
INDH	0.026	0.095*	-0.159***	-0.112**	-0.229***	-0.145***	-0.063	
INDI	-0.042	0.067+	0.165***	-0.178***	-0.363***	-0.230***	-0.101*	-0.138***

Statistical significance based on two-tailed tests. Test of significance: *** < 0.001, ** < 0.01, * <0.05, + <0.10.
Variable definitions: *LAF*: natural log of audit fees; *LNAF*: natural log of non-audit fees; *LTA*: natural log of total assets; *INVARAT*: inventory and receivables divided by total assets; *ROA*: Return on assets, defined as net income divided by total assets; *LOSS*: Indicator variable equal to 1 if the company reports a negative net income in the current fiscal year (0 otherwise); *DTA*: Total debt divided by total assets; *QUICK*: current assets minus inventory divided by current liabilities; *BIG4*: Indicator variable equal to 1 whether the auditor is a member of the Big 4 (0 otherwise); *AUDCHG*: Indicator variable equal to 1 if there has been an auditor change (0 otherwise); *LAG*: natural log of the number of days between current fiscal year end and the issuance of the audit report ; *DUAL*: Indicator variable equal to 1 if the company quotes on the Nasdaq, the OMX Europe, the NYSE or the LSE (0 otherwise); IND B/C: agricultural and construction sector (SIC codes 01-17); IND D: manufacturing (SIC codes 20-39) ; *IND E*: transport and public utilities (SIC codes 40-49); *IND F/G*: wholesale and retail trade (SIC codes 50-59); *IND H*: real estate (SIC codes: 65); *IND I*: services (SIC codes: 70-89).

4.5.3. Regression results

Table 4.8 provides the cross-sectional results of the OLS regression for 2003, for the data related to the group accounts and the parent company accounts.

4.5.3.1. Model estimation for group accounts

Not surprisingly (Hay, 2013), the models perform well; the adjusted *R2* is 79.35% for audit fees and slightly lower for non-audit fees (63.80%).

Table 4.8. OLS regression results. Base year 2003

	Group accounts						Parent company accounts					
	Audit fee model[a] Dependent variable: *LAF*		Non-audit fee model[a] Dependent variable: *LNAF*		Total fee model[a] Dependent variable: *TANAF*		Audit fee model[a] Dependent variable: *LAF*		Non-audit fee model[a] Dependent variable: *LNAF*		Total fee model[a] Dependent variable: *TANAF*	
	Coefficient	Sig.[b]	Coefficient	Sig.[b]	Coefficient	Sig.[b]	Coefficient	Sig.[b]	Coefficient	Sig.[b]	Coefficient	Sig.[b]
Intercept	-9.164	***	-8.054	**	-10.077	***	-9.765	***	-5.878	*	-9.405	***
LTA0	0.681	***	0.411	+	0.792	***	0.658	***	0.558	+	0.718	***
LNAF (LAF)	0.119		(0.637)	**			0.021		(0.220)			
INVARAT	0.503		-1.132		0.054		0.957	*	-1.460		0.426	
ROA	-0.110		6.407	*	1.263		0.183		3.788		0.635	
LOSS	0.563	*	-0.263		0.479	*	0.333		-0.121		0.393	
DTA	-0.620		1.177		-0.186		-0.531		0.619		-0.254	
QUICK	-0.111		0.757	**	0.107		-0.704		0.061		-0.061	
BIG4	0.765	**	1.124	+	1.214	***	0.481	*	1.025		0.739	**
AUDCHG	0.031		-1.419	**	-0.383		-0.023		-1.625	**	-0.549	+
LAG	1.048	**			0.869	*	1.134	**			0.925	+
DUAL	-0.483	*	0.321		-0.291		-0.111		-0.007		0.099	
IND D	0.003		0.459		0.220		0.039		-0.823		0.068	
IND E	-0.244		0.622	+	0.111		-0.206		-0.159		-0.041	
IND FG	0.378		0.520		0.683		1.058	*	0.976		1.394	**
IND H	-0.998	*	-1.690	+	-1.401	***	-0.283	***	-2.303	**	-0.599	*
IND I	0.493	+	-0.624		0.467		0.273		-1.225		0.063	
Adjusted R^2 (%)	79.35		63.80		82.81		73.62		41.63		75.41	
F-statistic	30.78	***	31.33	***	30.70	***	18.07	***	13.83	***	21.00	***
N	85		85		85		85		85		85	

Notes: [a] Model estimated using robust standard error adjusted for clustering by firm.

b All p-values are two-tailed. Test of significance: *** <0.001, ** <0.01, * <0.05, + <0.10.

Variable definitions: LAF , natural log of audit fees; LNAF , natural log of non-audit fees; TANAF , natural log of total fees; LTA , natural log of total assets; INVARAT , inventory and receivables divided by total assets; ROA , return on assets, defined as net income divided by total assets; LOSS , indicator variable equal to 1 if the company reports a negative net income in the current fiscal year (0 otherwise); DTA , total debt divided by total assets; QUICK , current assets minus inventory divided by current liabilities; BIG4 , indicator variable equal to 1 if the auditor is a member of the Big 4 (0 otherwise); AUDCHG , indicator variable equal to 1 if there has been an auditor change (0 otherwise); LAG , natural log of the number of days between current fiscal year end and the issuance of the audit report; DUAL , indicator variable equal to 1 if the company quotes on the Nasdaq, the OMX Europe, the NYSE or the LSE (0 otherwise); IND D , manufacturing (SIC codes 20–39); IND E , transport and public utilities (SIC codes 40–49); IND F/G , wholesale and retail trade (SIC codes 50–59); IND H , real estate (SIC codes: 65); IND I: services (SIC codes: 70–89).

The audit fee model presents, as expected, positive coefficients for *LTA*, *LOSS* and *LAG* that are significant at conventional levels. These results show that audit fees are higher for larger and riskier companies. We also report a positive and significant association between the natural log of consultancy services (LNAF) and the natural log of audit fees (LAF), suggesting that customers that like to enhance their financial information prefer to receive both audit and consultancy services from the same group. Consistent with our predictions, BIG4 is positive and significant. However, Spanish companies that are dually listed on international markets (variable labelled DUAL) are associated with a significant decrease in audit fees, which does not follow prior evidence (Griffin et al., 2009).

Regarding the independent variables related to the industrial sectors, only the real state sector is significant at 5% but with a negative sign. A plausible explanation for this finding is that the benchmark year 2003 is in the middle of the real estate and property boom in Spain.

The main drivers of the non-audit fee model are also related to the audit fees (LAF). The auditee attributes such as its size (LTA), profitability (ROA) and liquidity (QUICK) also present positive coefficients, suggesting that financially healthier companies engaged in more consultancy services. On average, BIG4 audit firms earn higher non-audit fees than the remaining auditors. It is noteworthy that according to the negative coefficient of AUDCH, the successor auditor is associated with lower consultancy fees, after controlling for the remaining independent variables. Two different reasons might explain this finding: either auditee companies receive more consultancy services after having a certain experience and knowledge of the audit group (as reported by Monterrey and Sanchez-Segura, 2007) or the new auditing group applies significant discounts to the consultancy services (lowballing). Additionally, real estate companies also exhibit significantly lower consultancy fees.

Finally, the total fee model reported in Table 4.8 also exhibits good fit, with an adjusted R2 of 82.81%. The results show that the auditee size is positively

significant at the 1‰ level. Audit inherent risk, as measured through LOSS and LAG variables, increases the total amount of fees paid to the same auditing group. BIG4 auditors are associated with higher bills; conversely, real estate companies pay lower fees.

4.5.3.2. Model estimation for parent company accounts

Once more, the models presented in Table 4.8 present good fit, although slightly lower fit than the models built for the consolidated accounts. The non-audit fee model presents a larger drop (41.63%) compared with the group account model (63.80%).

In general, the main drivers of the audit fees remain in the model built on individual accounts data. Regarding the auditee size (LTA), the audit fee model for the individual accounts replicates the sign and the level of significance for the consolidated accounts; the approach to the audit risk through LAG remains significant at the 1% level. Also consistent with our predictions, BIG4 is positive and significant, although at the 5% level; and the real state sector is now significant at the 1‰ level. Conversely, the reported losses (LOSS) are no longer significant. The complexity of supervision, measured as the level of inventory in relation to the total assets (INVARAT), seems to be more important. We note that the consultancy service fees exhibit a very low coefficient and are not significant, suggesting that there is no interaction between audit and consultancy services.

Regarding non-audit fee services, the size of the customer (LTA), measured in log terms, is significant but only at the 10% level. Furthermore, the only control variables that exhibit a significant association at the 1% level are the auditor rotation (AUDCH) and the real state sector, both with negative coefficients. Therefore, we find that audit groups practice lowballing. However, in terms of the consultancy fees, at that moment, the real state sector enjoys important price discounts.

The total fee model for the individual accounts exhibits significant variables, with different degrees, related to the auditee size (LTA), the audit firm (BIG4) and the companies included in the retailing industry (IND *F/G*) and the real state sector (IND *H*). In addition, auditor change (AUDCH) and the natural log of the number of days between current fiscal year end and the issuance of the audit report (LAG) are significant but at the 10% level.

4.5.4. The prediction errors

We use the estimated models displayed in Table 4.8, as commented above, to predict the values for each firm-year of the audit, consultancy and total services that would have been reported had the new accounting regimes not taken place. Tables 4.9 and 4.10 show the prediction errors that we identify for the period 2004–2009.

4.5.4.1. Fees related to the consolidated financial statements

In panel A of Table 4.9, we report the fee prediction errors over the seven years of the study using the 2003 model as a benchmark.

We identify positive prediction errors from 2004 to 2009, i.e., actual audit fees are higher than the expected values, which we consider mainly attributable to the IFRS adoption, as explained in prior sections. We note that beginning in 2005, the first year of IFRS adoption by the listed groups, the coefficient of audit fee is significant at 5% and the degree of significance increases along the period of analysis until it reaches 1‰. The significant premium percentage in 2005 represents an unexpected lift in audit fees of 17%, when compared with 2003. In 2006, the percentage of prediction error is 27%, i.e., 10 points higher than in 2005. It is remarkable that the difference in the coefficient of 2007 from the prior year (29% and 27%) is only 2 points, but now the 29% of unexpected increase compared with 2003 is significant at the 1‰ level. We are aware that the results include the cumulative

error identified in the prior years, as all coefficients are compared with the base year 2003. Although the significant coefficients increase consistently until 2008, the highest differentials take place in 2006 (from 17% to 27% of the predicted value) and 2008 (from 29% to 42%).

The results related to the consultancy services (Panel A, Table 4.9) indicate that in 2006 and 2007, the fees are lower than the expected ones, but only in 2007 the value exhibits significance at conventional levels. In the following years, 2008 and 2009, the level of significance is similar (10%) but, conversely, the coefficients are positive.

The difference between the actual evolution of the total fees and the expected evolution is also reported in Panel A of Table 4.9. Clearly, behaviour of this magnitude reflects the net result of its components. The level of significance increases because the model is accumulating the prediction errors estimated in previous years, except for 2006 and 2007, for which the level of significance is lower due to the behaviour of consultancy fees, which presents a negative coefficient in this year.

Table 4.9. Fee prediction errors. Consolidated financial statements

Years	2003	2004	2005	2006	2007	2008	2009
Panel A Cumulative Mean Fee Prediction Errors: (Actual fees-Predicted fees)/ Predicted fees[a]							
Audit fees (%)	0	6	17*	27**	29***	42***	36***
Non-audit fees (%)	0	-7	11	-7	-29+	39+	54+
Total fees (%)	0	4	19*	23*	16+	43***	40***
Panel B Mean change of fee prediction errors after removing the cumulative errors (in logarithmic terms) [b]							
Audit fees	0	0.082*	0.093+	0.084+	0.017	0.094	-0.043
Non-audit fees	0	-0.052	0.177	-0.179	-0.265	0.669***	0.100
Total fees	0	0.055	0.135*	0.039	-0.058	0.206***	-0.019
Panel C Mean change of fee prediction errors after removing the cumulative errors (in euros)[c]							
Audit fees		58,011	108,243	44,393	137,982	31,571	28,744
Non-audit fees		-73,750	15,959	-41,141	-87,522	36,566	122,752
Total fees		15,399	118,384	51,200	109,931	80,553	168,867

Test of significance: *** < 0.001, **< 0.01, *< 0.05, + < 0.10, respectively, two-tailed tests

[a] Fee premium percentage is calculated as $exp\big(LAF - E(LAF|IFRS = 0)\big) - 1$, where LAF is the log of the actual fee paid and $E(LAF|IFRS = 0)$ is the predicted log fee using the 2003 model as the fee expectation model. This formula measures the greater (lower) percentage of fee paid with regard to the expected one, measured as: $AF\ IFRS\ premium = (IFRSauditfee - PAFEE)/(PAFEE)$ y $NAF\ IFRS\ premium = (IFRSnonauditfee - PNAFEE)/(PNAFEE)$. The p-values are for differences from zero.

[b] Mean values of the log of the change of the fee prediction error, calculated as the fee prediction error after deducting the cumulative errors from 2003 through year t-1. The p-values are for differences from zero.

[c] Mean values of the impact of the fee prediction error in thousand euros, calculated as the fee prediction error after deducting the cumulative errors from 2003 through year t-1.

Table 4.10. Fee prediction errors. Individual financial statements

Years	2003	2004	2005	2006	2007	2008	2009
Panel A Mean Fee Prediction Errors: (Actual fees-Predicted fees)/ Predicted fees[a]							
Audit fees (%)	0	1	8	14+	15*	38***	50***
Non-audit fees (%)	0	29	46+	8	-13	30	15
Total fees (%)	0	9	24*	10	5	30**	40**
Panel B Mean change of fee prediction errors in logarithmic terms[b]							
Audit fees	0	0.050	0.076	0.049	0.013	0.177**	0.091+
Non-audit fees	0	0.232	0.118	-0.294+	-0.217+	0.400+	-0.999
Total fees	0	0.105	0.128	-0.112	-0.055	0.218**	0.085
Panel C Mean change of fee prediction errors in euros[c]							
Audit fees		8,577	30,502	4,066	-15,390	65,409	10,962
Non-audit fees		-9,500	4,228	19,888	-20,626	-20,938	-12,132
Total fees		-19,438	38,983	13,084	-37,393	76,058	496

Test of significance: *** < 0.001, **< 0.01, *< 0.05, + < 0.10, respectively, two-tailed tests

[a] Fee premium percentage is calculated as $exp\big(LAF - E(LAF|NPGC = 0)\big) - 1$, where LAF is the log of the actual fee paid and $E(LAF|NPGC = 0)$ is the predicted log fee using the 2003 model as the fee expectation model. This formula measures the greater (lower) percentage of fee paid with regard to the expected one, measured as: $AF\ NPGC\ premium = (NPGCauditfee - PAFEE)/(PAFEE)$ y $NAF\ NPGC\ premium = (NPGCnonauditfee - PNAFEE)/(PNAFEE)$. The p-values are for differences from zero.

[b] Mean values of the log of the change of the fee prediction error, calculated as the fee prediction error after deducting the cumulative errors from 2003 through year t-1. The p-values are for differences from zero.

[c] Mean values of the impact of the fee prediction error in thousand euros, calculated as the fee prediction error after deducting the cumulative errors from 2003 through year t-1.

Similar to Menon and Williams (2001), we separate the prediction error in a given year into two parts. The first part collects the cumulative prediction error as a consequence of the effect of events from 2003 through year $t - 1$; the second part reflects the error attributable to factors with origin in year *t*. This method removes the cumulative changes in the prediction error and allows us to detect whether significant events take place in a certain year given that the aggregate impact of these errors can create a significant (non-significant) cumulative difference.

In Panels B and C of Table 4.9, we report the errors attributable only to factors with origin in year *t* in logarithmic terms and euros, respectively.

As shown in Panel B of Table 4.9, the significant difference in audit fees at the 5% level occurs in 2004; meanwhile, the degree of significance is lower (10%) in 2005 and 2006. In all, it seems that the unexpected higher audit fees arise around the IFRS implementation period. Regarding non-audit fees, the only coefficient reporting a significant annual change is 2008, i.e., the year of NPGC implementation. The total amount of audit and consultancy fees is significant in 2005 and 2008.

Following the suggestion of one of the anonymous reviewers, we quantify the euro equivalent of the log of the change of the fee prediction error to assess the average impact in euros as a consequence of the unexpected increase in fees after using the 2003 model. The figures are reported in Panel C of Table 4.9. In 2004, the IFRS premium increases up to 58,011 euros per listed group, but it almost doubles in 2005 (108,243), and it decreases to 44,393 euros in 2006. The consultancy fees only rise 36,566 euros per group in 2008, with a level of significance of 1‰. The total actual bill exceeded the predicted bill by 118,384 euros in 2005 and by 80,553 euros in 2008.

4.5.4.2. Fees related to the parent companies' financial statements

Table 4.10 presents the mean prediction errors obtained from 2004 to 2009 for the parent companies. Similar to the methods used for the listed groups, we document the fee tendency using the 2003 model as the fee expectation model. We consider our results mainly attributable to the NPGC implementation, as previously explained.

In Table 4.10, Panel A refers to the premium fees as a percentage in relation to the predicted fees. This premium is calculated as the difference between the actual fees and the predicted values that would have been paid in the event that the NPGC had not been implemented. The pattern of audit fee prediction errors experiences a significant unexpected increase in 2006. In addition, we identify a consistent increase in the coefficients over the remainder of the period of study, lifting its level of significance in 2008 and 2009 to 1‰. The results for 2008 and 2009 show that the premium increases up to 38% and 50%, respectively. These results suggest an overall increase in the audit fees charged from 2008, the cut-off date for the NPGC.

Although the coefficients for the consultancy services (Panel A in Table 4.10) are unexpectedly high in 2005, their significance is weak (10% level). Finally, the significant figures for the total fees cover the years 2005, 2008 and 2009, coinciding with the first years in which the IFRS/NPGC took place.

However, once the accumulated errors are discounted, the data displayed in Panel B of Table 4.10 are conclusive. In 2008, the NPGC implementation year, the actual bills of the audit services are higher than the expected bill at 1% level of significance. In 2009, the coefficient is also significant but at the lowest level (10%). The finding regarding the consultancy bill is that the variations are significant at conventional levels but with different signs, confirming the bumbling trend along the period of analysis. The evolution of the total fees supports the notion of an unexpected increase in 2008 resulting from both services as a reaction to the implementation of the NPGC for the parent companies.

The economic interpretation of these prediction errors, reported in Panel C of Table 4.10, indicates that in 2008 and 2009, the extra amount of audit fees was 65,409 euros and 10,962 euros per company, respectively. On average, the mean premium associated with the total fees paid by the Spanish parent companies is 76,058 euros per company in 2008.

4.6. Robustness tests

Because the fee premiums over the six-year period are predicted using the 2003 model as the target year, we investigate whether there are significant changes in either the independent variables or the audit fee model during the period of analysis that could influence the estimation errors.

First, we analyse whether, due to the new accounting rules, there are significant changes in the independent variables (e.g., total assets) that might influence the behaviour of the variables of interest. With that aim, we apply t-tests to the winsorised values of the independent variables in each of the two consecutive years. The results, although not reported, show that none of the determinants exhibit significant variations except for the LOSS variable for the years 2007/2008 and 2008/2009 in the consolidated accounts fee models and the LOSS and QUICK variables for the years 2007/2008 in the individual accounts fee model, all of which are significant at conventional levels. A plausible explanation for this increase in the reported losses and the lesser values of QUICK is the severe financial crisis that hit the Spanish economy beginning in 2007. Because the total assets and the remaining determinants do not suffer important variations, we conclude that the increases in the audit fees are not biased by changes in the underlying variables.

Second, we investigate whether there are any changes in the fee models from 2003 until 2009. Tables 4.11–4.14 exhibit the coefficients of the regressions per year. Statistical outcomes of the audit fee model are reported in Table 4.11. Overall, the main drivers, auditee size and the provision of consultancy services, remain

significant over the years of the sample, as does the coefficient related to the real state sector. Conversely, other determinants exhibit levels of significance that are less stable, and the negative coefficient of DUAL shifts to positive and loses its significance in 2009. Importantly, the audit model performs well; the adjusted *R*2 value not only is high but also increases from 2005 to 2009, when it reaches a value of 88.25%. Therefore, the model is increasing its explanatory power. Regarding consultancy services, the model (displayed in Table 4.12) also seems to perform better over the years, reaching a goodness of fit of 74.63% in 2009, but only the natural log of audit fees keeps its significance at either 1% or 1‰ over the period of analysis.

The audit fee model for parent companies' financial statements, reported in Table 4.13, shows a lower level of goodness of fit than the group account model, and it performs worse over the years (adjusted *R*2 decreases from 73.62% in 2003 to 56.42% in 2009), although the size of the auditee firm still remains as the main driver of audit fees. Non-audit fees reported in individual financial statements (Table 4.14) are less predictable, and none of the determinants maintain their influence through the period of analysis.

Because the fee models for the individual statements lessen the explanatory power throughout the years, we estimate the fee prediction errors using 2006 as the base year, i.e., two years prior to the second regulatory change (NPGC implementation). The new prediction errors are displayed in Tables 4.15 and 4.16. For group accounts, the prediction error is significant but shows a negative coefficient, i.e., the predicted value is higher than the actual value. A feasible explanation for this finding is that, as reported in Table 4.9, the audit fee values in 2006 are high in comparison with the whole time series and, therefore, the predictions are higher than those estimated using 2003 as the year of reference. Prediction errors for audit fees related to the supervision of individual accounts (Table 4.16) keep their level of significance in years 2008 and 2009, in line with the 2003 year-based results reported in Table 4.10.

Table 4.11. Audit fees regression results. Consolidated financial statements

Years	**2003**		**2004**		**2005**		**2006**		**2007**		**2008**		**2009**	
Dependent variable: *LAF*	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig
Intercept	-9.164	***	-6.245	**	-2.393		-2.040		-4.405	*	-3.457	*	-3.793	**
LTA	0.681	***	0.644	***	0.647	***	0.607	***	0.687	***	0.543	***	0.518	***
LNAF	0.119	*	0.144	***	0.141	**	0.140	***	0.143	**	0.273	***	0.268	***
INVARAT	0.503		0.503		0.722		0.854		1.226	*	0.704		0.299	
ROA	-0.110		0.305		-0.980		-1.169		-1.751		-1.232		-1.433	
LOSS	0.563	*	0.335		0.068		0.233		0.132		-0.128		-0.016	
DTA	-0.620		-0.310		-0.178		0.488		-0.483		-0.290		-0.557	
QUICK	-0.111		-0.023		0.092		0.200		0.114		-0.082		0.413	*
BIG4	0.765	*	0.508	+	0.220		0.244		0.134		-0.195		-0.084	
AUDCHG	0.032		-0.327		-0.415	+	-0.215		-0.341		-0.213		0.283	+
LAG	1.048	**	0.490		-0.340		-0.437		0.026		0.254		0.312	
DUAL	-0.483	*	-0.451	*	-0.457	*	-0.327	+	-0.450	*	-0.291	*	0.005	
IND D	0.003		0.007		-0.029		0.045		-0.002		-0.023		0.146	
IND E	-0.244		-0.216		-0.279		-0.194		-0.194		-0.084		0.026	
IND F/G	0.378		0.197		0.717	**	0.974	***	0.703	**	0.715	*	0.639	**
IND H	-0.998	*	-0.985	**	-0.944	**	-1.078	**	-0.991	**	-1.071*	**	-0.906	**
IND I	0.493		0.415		0.464	+	0.629	**	0.546	*	0.320		0.240	
Adjusted R^2 (%)	79.35		79.01		81.63		83.00		82.04		86.20		88.25	
N	85		90		90		90		90		90		90	

All p-values are two tailed. Test of significance of coefficients: *** < 0.001, **< 0.01, *< 0.05, + < 0.10

Variable definitions: *LAF*: natural log of audit fees; *LTA*: natural log of total assets; *LNAF*: natural log of non-audit fees*; INVARAT*: inventory and receivables divided by total assets; *ROA*: Return on assets, defined as net income divided by total assets; *LOSS*: Indicator variable equal to 1 if the company reports a negative net income in the current fiscal year (0 otherwise); *DTA*: Total debt divided by total assets; *QUICK*: current assets minus inventory divided by current liabilities; *BIG4*: Indicator variable equal to 1 whether the auditor is a member of the Big 4 (0 otherwise); *AUDCHG*: Indicator variable equal to 1 if there has been an auditor change (0 otherwise); *LAG*: natural log of the number of days between current fiscal year end and the issuance of the audit report ; *DUAL*: Indicator variable equal to 1 if the company quotes on the Nasdaq, the OMX Europe, the NYSE or the LSE (0 otherwise) ; *IND D*: manufacturing (SIC codes 20-39) ; *IND E*: transport and public utilities (SIC codes 40-49) ; *IND F/G*: wholesale and retail trade (SIC codes 50-59); *IND H*: real estate (SIC codes: 65); *IND I*: services (SIC codes: 70-89).

Table 4.12. Non-audit fees regression results. Consolidated financial statements

Years	**2003**		**2004**		**2005**		**2006**		**2007**		**2008**		**2009**	
Dependent variable: *LNAF*	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig
Intercept	-8.054	**	-5.476	*	-2.870		-4.827		-7.445	*	-3.435		-4.102	+
LTA	0.411	+	0.025		-0.133		0.176		0.226		-0.277		-0.267	
LAF	0.637	**	1.024	***	0.965	**	1.093	***	0.924	**	1.489	***	1.694	***
INVARAT	-1.132		-1.195		-3.811	**	-3.705	*	-3.413	*	-1.264		0.409	
ROA	6.407	*	5.862	+	-0.090		0.737		4.520		2.110		3.537	
LOSS	0.263		-0.093		0.582		0.166		0.536		0.475		0.378	
DTA	1.177		2.575	+	2.967	+	0.141		2.946	*	1.529		2.713	**
QUICK	0.757	**	0.833	***	0.520		0.079		0.184		0.456		-0.856	*
BIG4	1.236	+	0.705		2.382	**	0.315		0.430		1.109	+	0.664	
AUDCHG	-1.419	**	-0.148		-0.099		-0.473		0.201		0.685		-0.851	**
LAG														
DUAL	0.321		-0.228		-0.035		0.384		0.926	+	0.573	+	-0.392	
IND D	0.459		0.413		0.220		1.232	*	1.426	*	0.687		0.180	
IND E	0.622		0.502		0.054		0.300		0.605		0.403		0.228	
IND F/G	0.520		0.042		-0.916		-1.736	*	-0.210		-1.398		-0.405	
IND H	-1.690	+	-0.965		-1.812		0.309		-0.314		1.131		0.988	
IND I	-0.624		0.143		-0.158		0.592		0.983		0.366		0.688	
Adjusted R^2 (%)	63.80		48.71		57.21		58.35		65.55		70.97		74.63	
N	85		90		90		0.583		0.655		0.710		0.746	

All p-values are two tailed. Test of significance of coefficients: *** < 0.001, **< 0.01, *< 0.05, + < 0.10

Variable definitions: *LNAF*: natural log of non-audit fees; *LTA*: natural log of total assets; *LAF*: natural log of audit fees; *INVARAT*: inventory and receivables divided by total assets; *ROA*: Return on assets, defined as net income divided by total assets; *LOSS*: Indicator variable equal to 1 if the company reports a negative net income in the current fiscal year (0 otherwise); *DTA*: Total debt divided by total assets; *QUICK*: current assets minus inventory divided by current liabilities; *BIG4*: Indicator variable equal to 1 whether the auditor is a member of the Big 4 (0 otherwise); *AUDCHG*: Indicator variable equal to 1 if there has been an auditor change (0 otherwise); *LAG*: natural log of the number of days between current fiscal year end and the issuance of the audit report ; *DUAL*: Indicator variable equal to 1 if the company quotes on the Nasdaq, the OMX Europe, the NYSE or the LSE (0 otherwise) ; *IND D*: manufacturing (SIC codes 20-39) ; *IND E*: transport and public utilities (SIC codes 40-49) ; *IND F/G*: wholesale and retail trade (SIC codes 50-59); *IND H*: real estate (SIC codes: 65); *IND I*: services (SIC codes: 70-89).

Table 4.13. Audit fees regression results. Individual financial statements

Years	**2003**		**2004**		**2005**		**2006**		**2007**		**2008**		**2009**	
Dependent variable:	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig
LAF														
Intercept	-9.765	***	-7.595	***	-6.967	**	-4.351	+	-5.414	**	-2.665		-0.558	
LTA	0.659	***	0.591	***	0.592	***	0.440	***	0.480	***	0.549	***	0.491	***
LNAF	0.021		0.053		-0.020		0.118	*	0.108	*	0.088	*	0.069	
INVARAT	0.957	*	1.142	**	1.386	**	1.151	*	0.726	*	0.758		0.459	
ROA	0.187		0.813		-0.300		-0.404		-0.869		-2.231		-0.143	
LOSS	0.333		0.767	**	0.416	+	0.259		-0.425	+	-0.168		0.215	
DTA	-0.531		-0.636		-0.639		-0.546		-0.739		-0.915		-0.631	
QUICK	-0.070		0.056		0.017		0.021		-0.006		-0.055		-0.023	
BIG4	0.481	*	0.321		0.611	*	0.232		0.071		-0.043		0.084	
AUDCHG	-0.023		-0.489	+	-0.120		-0.046		-0.452	*	0.048		0.221	
LAG	1.134	**	0.781	*	0.641		0.505		0.727	*	-0.015		-0.440	
DUAL	-0.111		-0.174		-0.115		0.089		-0.217		-0.121		-0.110	
IND D	0.039		0.296		0.150		0.213		0.422		0.479		0.592	+
IND E	-0.206		0.139		0.465		0.245		0.250		0.326		0.490	
IND F/G	1.058	*	0.684	+	0.488		0.885	*	0.756	*	0.446		0.671	+
IND H	-0.283		-0.055		-0.245		-0.350		-0.132		-0.146		-0.125	
IND I	0.274		0.161		0.460		0.324		0.761	+	0.659	+	0.820	*
Adjusted R^2 (%)	73.62		66.93		60.70		56.91		62.31		57.10		56.42	
N	85		88		88		88		88		88		87	

All p-values are two tailed. Test of significance of coefficients: *** < 0.001, **< 0.01, *< 0.05 ,+ < 0.10

Variable definitions: *LAF*: natural log of audit fees; *LTA*: natural log of total assets; *LNAF*: natural log of non-audit fees; *INVARAT*: inventory and receivables divided by total assets; *ROA*: Return on assets, defined as net income divided by total assets; *LOSS*: Indicator variable equal to 1 if the company reports a negative net income in the current fiscal year (0 otherwise); *DTA*: Total debt divided by total assets; *QUICK*: current assets minus inventory divided by current liabilities; *BIG4*: Indicator variable equal to 1 whether the auditor is a member of the Big 4 (0 otherwise); *AUDCHG*: Indicator variable equal to 1 if there has been an auditor change (0 otherwise); *LAG*: natural log of the number of days between current fiscal year end and the issuance of the audit report ; *DUAL*: Indicator variable equal to 1 if the company quotes on the Nasdaq, the OMX Europe, the NYSE or the LSE (0 otherwise) ; *IND D*: manufacturing (SIC codes 20-39) ; *IND E*: transport and public utilities (SIC codes 40-49) ; *IND F/G*: wholesale and retail trade (SIC codes 50-59); *IND H*: real estate (SIC codes: 65); *IND I*: services (SIC codes: 70-89).

Table 4.14. Non-audit fees regression results. Individual financial statements

Years	**2003**		**2004**		**2005**		**2006**		**2007**		**2008**		**2009**	
Dependent variable: *LNAF*	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig
Intercept	-5.878	*	-2.997		-4.233	+	-6.018	**	-6.809	**	-5.364	*	-3.359	
LTA	0.558	+	0.236		0.512	+	0.372		0.368		0.213		0.169	
LAF	0.220		0.445		-0.079		0.717	*	0.662	*	0.478	*	0.486	
INVARAT	-1.460		-2.755	*	-1.156		-1.854	+	-1.985	*	-1.038		-2.317	+
ROA	3.788		3.155		-0.983		-0.592		1.610		0.716		-0.129	
LOSS	-0.121		-0.974		-0.216		-0.702		0.822		1.038	+	-0.138	
DTA	0.619		1.546		0.425		1.423		2.174	*	2.219	*	3.283	**
QUICK	0.061		0.152		-0.049		-0.006		-0.021		0.302		-0.274	
BIG4	1.026		1.124		1.952	**	0.203		0.648		1.899	**	1.166	+
AUDCHG	-1.625	**	-0.347		-0.526		-1.349	**	0.384		0.570		-0.977	
LAG														
DUAL	-0.007		-0.077		-0.481		-0.103		0.528		0.507		0.350	
IND D	-0.823		-0.804		-1.147		0.387		0.019		-0.042		-0.489	
IND E	-0.159		0.371		0.347		1.019	+	0.946		0.970		0.580	
IND F/G	0.976		0.528		-0.129		-0.437		0.039		-0.538		-0.454	
IND H	-2.303	**	-2.044	*	-2.794	**	-0.740		-0.851		-1.038		-1.319	
IND I	-1.225		-0.541		0.349		1.219		0.079		-0.122		0.041	
Adjusted R^2 (%)	41.63		38.25		35.58		43.54		50.63		40.77		37.19	
N	85		88		88		88		88		88		87	

All p-values are two tailed. Test of significance of coefficients: *** < 0.001, **< 0.01, *< 0.05, + < 0.10

Variable definitions: *LNAF*: natural log of non-audit fees; *LTA*: natural log of total assets; *LAF*: natural log of audit fees; *INVARAT*: inventory and receivables divided by total assets; *ROA*: Return on assets, defined as net income divided by total assets; *LOSS*: Indicator variable equal to 1 if the company reports a negative net income in the current fiscal year (0 otherwise); *DTA*: Total debt divided by total assets; *QUICK*: current assets minus inventory divided by current liabilities; *BIG4*: Indicator variable equal to 1 whether the auditor is a member of the Big 4 (0 otherwise); *AUDCHG*: Indicator variable equal to 1 if there has been an auditor change (0 otherwise); *LAG*: natural log of the number of days between current fiscal year end and the issuance of the audit report ; *DUAL*: Indicator variable equal to 1 if the company quotes on the Nasdaq, the OMX Europe, the NYSE or the LSE (0 otherwise) ; *IND D*: manufacturing (SIC codes 20-39) ; *IND E*: transport and public utilities (SIC codes 40-49) ; *IND F/G*: wholesale and retail trade (SIC codes 50-59); *IND H*: real estate (SIC codes: 65); *IND I*: services (SIC codes: 70-89).

Non-audit fee premiums associated with NPGC implementation are significant in 2008 for both consolidated accounts (at 5%) (Table 4.15) and individual financial statements (at 10%) (Table 4.16).

Our following analysis splits our sample into a high and low audit fee ratio (audit fee to total fees ratio) to examine whether our findings might be due to companies with a high proportion of audit services. Tables 4.17–4.20 report our results for both the 25th and 75th percentiles based on the fee ratio. Given that the number of companies presents no uniformity over the six-year period, we cannot remove the accumulative prediction error of each firm from 2003 through year $t - 1$. Specifically, we report price pattern differences across listed groups and parent companies according to their relative amount of audit fees. Consistent with our main results, the coefficients for group accounts with higher levels of non-audit services are significantly higher around the years of IFRS/NPGC implementation (Table 4.17). Conversely, for those in the 75th percentile, we notice a lack of significance that could be due to the cumulative effect in prior years, which lead to a non-significant coefficient in 2005 and 2006 (Table 4.19). Finally, as expected, parent companies present a significantly positive audit fee trend around the years of the NPGC implementation (Tables 4.18 and 4.20).

In all, the robustness tests confirm the prior results obtained in the main research reported in the prior section.

Table 4.15. Fee prediction errors. Consolidated financial statements. Base year 2006

Years	2006	2007	2008	2009
Panel A: Mean fee prediction errors = (Actual fees − Predicted fees)/Predicted fees[a]				
Audit fees (%)	0	3	−8	−14*
Non-audit fees (%)	0	−22	24	1
Total fees (%)	0	−5	−3	−11
Panel B: Mean change of fee prediction errors in logarithmic terms[b]				
Audit fees	0	0.031	−0.112**	−0.070+
Non-audit fees	0	−0.252	0.464**	−0.202
Total fees	0	−0.048	0.021	−0.093*
Panel C: Mean change of fee prediction errors in euros[c]				
Audit fees		120,123	−157,992	−67,229
Non-audit fees		−55,344	−18,467	54,648
Total fees		104,128	−190,171	45,574

Notes: Test of significance: *** < 0.001, **< 0.01, *< 0.05, + < 0.10, respectively, two-tailed tests

[a] Fee premium percentage is calculated as $exp\big(LAF - E(LAF|IFRS = 0)\big) - 1$, where LAF is the log of the actual fee paid and $E(LAF|IFRS = 0)$ is the predicted log fee using the 2006 model as the fee expectation model. This formula measures the greater (lower) percentage of fee paid with regard to the expected one, measured as: $AF\ IFRS\ premium = (IFRSauditfee - PAFEE)/(PAFEE)$ and $NAF\ IFRS\ premium = (IFRSnonauditfee - PNAFEE)/(PNAFEE)$. The p-values are for differences from zero.

[b] Mean values of the log of the change of the fee prediction error, calculated as the fee prediction error after deducting the cumulative errors from 2006 through year t-1. The p-values are for differences from zero.

[c] Mean values of the impact of the fee prediction error in thousand euros, calculated as the fee prediction error after deducting the cumulative errors from 2006 through year t-1.

Table 4.16. Fee prediction errors. Individual financial statements. Base year 2006

Years	**2006**	**2007**	**2008**	**2009**
Panel A Mean Fee Prediction Errors: (Actual fees-Predicted fees)/ Predicted fees[a]				
Audit fees (%)	0	1	14 +	24 *
Non-audit fees (%)	0	-16	24	3
Total fees (%)	0	-9	23 *	31 **
Panel B Mean Change of Fee Prediction Errors in logarithmic terms[b]				
Audit fees	0	0.006	0.123 *	0.091 *
Non-audit fees	0	-0.178	0.396 +	-0.162
Total fees	0	-0.094	0.304 ***	0.067
Panel C Mean Change of Fee Prediction Errors in euros[c]				
Audit fees		-14,012	65,870	10,646
Non-audit fees		-26,152	-42,146	-5,434
Total fees		-41,094	98,950	-5,781

Test of significance: *** < 0.001, **< 0.01, *< 0.05, + < 0.10, respectively, two-tailed tests

[a] Fee premium percentage is calculated as $exp\big(LAF - E(LAF|NPGC = 0)\big) - 1$, where LAF is the log of the actual fee paid and $E(LAF|NPGC = 0)$ is the predicted log fee using the 2006 model as the fee expectation model. This formula measures the greater (lower) percentage of fee paid with regard to the expected one, measured as: $AF\ NPGC\ premium = (NPGCauditfee - PAFEE)/(PAFEE)$ and $NAF\ NPGC\ premium = (NPGCnonauditfee - PNAFEE)/(PNAFEE)$. The p-values are for differences from zero.

[b] Mean values of the log of the change of the fee prediction error, calculated as the fee prediction error after deducting the cumulative errors from 2006 through year t-1. The p-values are for differences from zero.

[c] Mean values of the impact of the fee prediction error in thousand euros, calculated as the fee prediction error after deducting the cumulative errors from 2006 through year t-1.

Table 4.17. Fee prediction errors. Consolidated financial statements. Base year 2003. Low audit fee ratio

Years	2003	2004		2005		2006		2007		2008		2009	
Panel A Mean Fee Prediction Errors: (Actual fees-Predicted fees)/ Predicted fees[a]													
Audit fees (%)	0	49	+	136	**	84	*	68	*	120	**	100	***
Non-audit fees (%)	0	-31		-45	**	-44	*	-36		-31		-19	
Total fees (%)	0	22		90	*	5		21		307	***	369	***
No. of Obs.	20	23		23		24		21		22		24	

Test of significance: *** < 0.001, **< 0.01, *< 0.05, + < 0.10, respectively, two-tailed tests

[a] Fee premium percentage is calculated as $exp\big(LAF - E(LAF|IFRS = 0)\big) - 1$, where LAF is the log of the actual fee paid and $E(LAF|IFRS = 0)$ is the predicted log fee using the 2003 model as the fee expectation model. This formula measures the greater (lower) percentage of fee paid with regard to the expected one, measured as: $AF\ IFRS\ premium = (IFRSauditfee - PAFEE)/(PAFEE)$ and $NAF\ IFRS\ premium = (IFRSnonauditfee - PNAFEE)/(PNAFEE)$. The p-values are for differences from zero.

Table 4.18. Fee prediction errors. Individual financial statements. Base year 2003. Low audit fee ratio

Years	2003	2004	2005	2006	2007	2008		2009	
Panel A Mean Fee Prediction Errors: (Actual fees-Predicted fees)/ Predicted fees[a]									
Audit fees (%)	0	0	12	11	-29	60	+	127	**
Non-audit fees (%)	0	6	19	-48	-44	-30		-57	
Total fees (%)	0	13	45	-42	-79	160	+	192	+
No. of Obs.	18	26	27	19	17	23		23	

Test of significance: *** < 0.001, **< 0.01, *< 0.05, + < 0.10, respectively, two-tailed tests

[a] Fee premium percentage is calculated as $exp\big(LAF - E(LAF|NPGC = 0)\big) - 1$, where LAF is the log of the actual fee paid and $E(LAF|NPGC = 0)$ is the predicted log fee using the 2003 model as the fee expectation model. This formula measures the greater (lower) percentage of fee paid with regard to the expected one, measured as: $AF\ NPGC\ premium = (NPGCauditfee - PAFEE)/(PAFEE)$ and $NAF\ NPGC\ premium = (NPGCnonauditfee - PNAFEE)/(PNAFEE)$. The p-values are for differences from zero.

Table 4.19. Fee prediction errors. Consolidated financial statements. Base year 2003. High audit fee ratio

Years	2003	2004	2005	2006	2007		2008	2009
Panel A Mean Fee Prediction Errors: (Actual fees-Predicted fees)/ Predicted fees[a]								
Audit fees (%)	0	-11	12	24	24	+	8	-17
Non-audit fees (%)	0	-4	-9	4	117	**	25	25
Total fees (%)	0	-11	10	23	34	*	10	-15
No. of Obs.	31	24	20	22	30		15	20

Test of significance: *** < 0.001, **< 0.01, *< 0.05, + < 0.10, respectively, two-tailed tests

[a] Fee premium percentage is calculated as $exp\big(LAF - E(LAF|IFRS = 0)\big) - 1$, where LAF is the log of the actual fee paid and $E(LAF|IFRS = 0)$ is the predicted log fee using the 2003 model as the fee expectation model. This formula measures the greater (lower) percentage of fee paid with regard to the expected one, measured as: $AF\ IFRS\ premium = (IFRSauditfee - PAFEE)/(PAFEE)$ and $NAF\ IFRS\ premium = (IFRSnonauditfee - PNAFEE)/(PNAFEE)$. The p-values are for differences from zero.

Table 4.20. Fee prediction errors. Individual financial statements. Base year 2003. High audit fee ratio

Years	2003	2004	2005	2006	2007		2008	2009	
Panel A Mean Fee Prediction Errors: (Actual fees-Predicted fees)/ Predicted fees[a]									
Audit fees (%)	0	6	17	9	44	*	22	70	*
Non-audit fees (%)									
Total fees (%)	0	6	17	9	44	*	22	70	*
No. of Obs.	35	28	23	23	28		17	26	

Test of significance: *** < 0.001, **< 0.01, *< 0.05, + < 0.10, respectively, two-tailed tests

[a] Fee premium percentage is calculated as $exp\big(LAF - E(LAF|NPGC = 0)\big) - 1$, where LAF is the log of the actual fee paid and $E(LAF|NPGC = 0)$ is the predicted log fee using the 2003 model as the fee expectation model. This formula measures the greater (lower) percentage of fee paid with regard to the expected one, measured as: $AF\ NPGC\ premium = (NPGCauditfee - PAFEE)/(PAFEE)$ and $NAF\ NPGC\ premium = (NPGCnonauditfee - PNAFEE)/(PNAFEE)$. The p-values are for differences from zero.

4.7. Conclusions

This paper examines the evolution of audit and non-audit fees from 2003 to 2009 in order to identify the impact, if any, of the IFRS implementation.

Our study was conducted in Spain, where the accounting reforms were developed in two differentiated phases, the first one being in 2005 for listed groups. Subsequently, the second phase took place in 2008 and involved the parent companies

through the adaptation of the international standards to the Spanish traditional structured accounting plan. Although prior literature document a fee premium associated with the IFRS adoption (Diehl, 2010; Griffin et al., 2009; Vieru and Shadewitz, 2010), to the best of our knowledge, no single study has addressed thus far the impact on audit fees of two consecutive periods of accounting-related changes, i.e., 2005 and 2008. The expected change in fees in the second benchmark period is elusive due, primarily, to the experience-based learning process. In addition, converse to prior studies (Kim et al., 2012), we conduct separated analyses over homogeneous groups of companies to avoid any bias due to the collateral influence, in case, of the voluntary adopters on audit fees. Finally, since audit and nonaudit fees provided by the same auditing group are interconnected (Antle et al., 2006; Krishnan and Yu, 2011; McMeeking et al., 2007; Stein, 2006; among others), we also explore variations in non-audit fees and total fees.

We document that audit fees exhibited an increasing path from 2003 to 2009 not only for group accounts (15% of constant growth rate in mean) but also for parent company accounts (13%).

By comparing the actual with the estimated data, and after removing the cumulative prediction error, we identify significant fee increases in 2004 and marginal fee increases in 2005 and 2006. Based on prior evidence (Kim et al., 2012), we attribute those errors to the IFRS adoption process and reveal that the increase did not take place in one year but were accrued along, at least, three years. We also report that this prior experience did not avoid the repeated increase in audit fees in 2008, which may be associated with the NPGC implementation.

Regarding the evolution of the consultancy fees for consolidated groups, the negative growth rate turned positive in 2005 and for the whole period, it rose up to 11%. The prediction errors for consultancy fees were not significant until 2008 for consolidated accounts. Results related to individual accounts exhibit an erratic pattern.

The limitations of this study, as stated by Diehl (2010), include those that stem from any possible misclassification of non-audit fees disclosure by the auditee companies or any relevant variable that influences non-audit fees and are not captured by our model. In addition, as one of the anonymous reviewer s suggested, we could not disentangle the two opposite influences of IFRS on auditors' effort from the overall effect on audit fees. The upward effect on audit costs of changing the accounting framework, as required by the ISA 315, and, conversely, the downward pressure on audit fees might stem from an 855 enhanced quality of financial information, as reported by Kim et al. (2012). In addition, although we are not aware of any other event that might have influenced the behaviour of audit fees, a non-identified shock stemming from governance reforms or other economic changes might also conceal our results.

Overall, our study suggests that the adoption of international standards in countries whose local standards differ significantly from the new normative greatly influences the complexity of the audit work and significantly increases audit fees. Therefore, policymakers should consider the potential costs of implementing new accounting regimes.

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CAPÍTULO 5. PROFITABILITY AND AUDIT MARKET STRUCTURE IN SPAIN: EVIDENCE WITHIN THE NEW ACCOUNTING REGULATORY FRAMEWORK

5.1. Introduction

Since the late sixties, when the seminal work by Zeff and Fossum (1967) revealed the high market share (95%) in the hands of the big auditing firms (Big) in the US, regulatory bodies have expressed ongoing concerns about the high concentration of the audit market. Much of this concern centres on the undesirable effects that such a level of concentration might trigger in terms of a) the excessive power wielded over policy-makers, who may succumb to the pressures of audit lobbies and promote policies biased in favour of the large auditing firms (Metcalf Report, 1977); b) the systemic risk for the audit market since, in many countries, almost all quoted companies are supervised by the Big 4, which raises serious fears that another debacle similar to that suffered by Andersen in 2002 could spark problems in the public interest entities segment (European Commission Green Paper 2010); and c) market performance with uncompetitively-high audit prices and abnormal profitability, among other issues (SOX 2002, GAO reports 2003, 2008 in the US; the UK Competition Commission Proposals[21], 2013; or, in the European Union, the European Commission Green Paper, 2010). Moreover, the challenges faced by mid-sized and small audit firms (capacity to audit large clients and barriers to entry) are frequently the subject of public debate (European Commission Green Paper, 2010).

This study responds to the call for contributions in Regulation (EU) 537/2014, wherein the European Parliament called for monitoring of developments in

[21] From April 2014 the Competition and Markets Authority

the market and in particular the risks that arise from high market concentration. We therefore investigate whether market concentration, under the structure-conduct-performance (SCP) paradigm; or market share, according to the relative market power (RMP) hypothesis influences the profitability ratios of the audit market suppliers. SCP postulates that in a concentrated market, the costs of collusion between firms are low and the market power exercised by the largest companies will also positively affect the returns of the mid-sized and small audit firms. Therefore, all audit firms, regardless of size, benefit from market concentration and make extra profits (Bain, 1951). On the contrary, according to the RMP hypothesis, large audit firms encourage product differentiation to boost their own market share and increase their own profitability. In both cases, it is also of interest to identify and assess the impact of entry barriers, which can prevent new actors from entering and competing in the market (Shepherd, 1982).

Within the traditional SCP paradigm developed in industrial organization economics (Bain, 1951), academia provides a great bulk of empirical evidence on audit market behaviour. In particular, researchers have devoted much attention to the effects on audit fees of increased concentration in the hands of the Big Firms and its consequences in terms of market competition (Pearson & Trompeter, 1994; Piot 2007; Carson et al., 2012). Another relevant branch of research aims to explain differences in pricing due to product differentiation and auditors' industry specialization (Craswell et al., 1995; DeFond et al., 2000; Casterella et al., 2004). Prior findings have generally associated high concentration ratios with the price *premium* charged by the largest audit firms (Francis, 1984; Palmrose 1986a; Francis and Stokes, 1986; Craswell et al., 1995; Carson et al., 2012).

However, there is no clear-cut evidence about the connections between market structure, in terms of concentration or market share, and audit firm profitability. It is common in banking research to test the SCP and RMP hypotheses (Berger, 1995; Tregenna, 2009; Mirzaei et al., 2013) but they have not been widely explored in the audit market. Notable exceptions are the contributions by Lee (2012)

and Ciconte et al. (2015). Ciconte et al. (2015) showed a positive influence of market concentration on audit profitability for one Dutch audit firm, while Lee (2012) reported a positive effect of both concentration and market share on profitability for accounting firms in Taiwan. The paucity of the findings requires additional insights into this controversial issue.

Hence, this research aims to shed some light on this topic, by investigating the interaction between market structure, conduct and performance. To our knowledge, this study is a pioneer in addressing both the SCP paradigm and the RMP hypothesis of industrial organization in the Spanish audit market. Additionally, prior research is limited to listed companies (Carrera et al, 2005; Ruiz-Barbadillo et al. 2016), whereas the scope of this research covers the whole audit market. Hence, we provide empirical evidence about the performance of small and medium-sized audit firms.

Additionally, Griffin et al. (2009), Diehl (2010), and Vieru and Schadewitz (2010) explored audit fee variations due to the IFRS implementation. However, the findings are not uniform because they depend on the quality of the financial information (Kim et al., 2012). De Fuentes and Sierra-Grau (2015) documented positive abnormal audit fees for group accounts of Spanish listed companies and individual accounts in the years of IFRS adoption, 2005 and 2008. Nevertheless, the final impact of IFRS adoption on audit firms' profitability remains a pending research topic that we explore in this study.

With that aim, we create two unbalanced panel data sets. The first consists of observations from a sample of 230 audit firms between 2003 and 2007: 18 audit firms that supervised listed group accounts and 212 audit firms of non-listed groups. On this panel data, we estimate a random effect model or a linear regression robust to standard errors (to alleviate multicollinearity problems), as required. The second sample is made up of data from 976 audit firms that supervised individual accounts during the period 2006-2010. In this case, we cannot build a control sample because all

individual accounts were prepared in accordance with the adapted IFRS. Hence, we estimate the unexpected variations in profitability ratios associated with the accounting reform by developing a profitability expectation model (similar to Menon and Williams, 2001; De Fuentes and Sierra-Grau, 2015) and using 2006 as the benchmark year.

Our results show that the RMP is the main driver of market structure–profitability relationship in both client segments (audit firms of consolidated and individual statements). Therefore, improved profitability stems from the market power exerted by audit firms as a result of their market share. Nevertheless, audit firm size is negatively associated with profitability. This finding raises doubts about the optimal firm size for enhancing profitability at the same time as avoiding scale inefficacies. Contrary to our expectations, we failed to prove that the accounting reforms are associated with unexpected (high) audit firm profitability values. Therefore, a plausible explanation for the unexpected (high) audit fees documented by De Fuentes and Sierra-Grau (2015) is that they are a response to the higher audit costs associated with the higher audit risk due to the implementation of the IFRS, as required by the *International Standard of Auditing 200*[22].

Our findings are relevant for regulatory bodies and policy makers, as stated by the European Union in Regulation (EU) 537/2014, because they do not indicate any anticompetitive behaviour on the part of the Big auditing firms. Moreover, although market share is positively associated with performance, it only applies to small audit firms.

The remainder of this paper is organized as follows. In Section 5.2, we review the previous literature and identify our research questions. Section 5.3 explains our sample selection and methodology. Section 5.4 describes the evolution of the variables related to market structure and profitability in the Spanish setting over the

[22] See in: https://www.ifac.org/system/files/meetings/files/3393.pdf

period of study. In Sections 5.5 and 5.6, we present our results and robustness tests. Finally, our conclusions are discussed in the last section.

5.2. Literature review and research questions

Within the traditional SCP view, market structure affects market conduct and ultimately impacts on market performance (Bain, 1951). From a static approach, the higher the supplier's concentration and the higher barriers to entry (market structure), the higher the probability of increasing supplier size inequalities, which helps boost the power of the largest firms. In turn, this increasing power may increase the likelihood of collusive behaviour (either Bertrand or Cournot oligopoly) and ultimately, lead to profitability above competitive levels (market performance), as stated by Shepherd (1990a).

In the auditing field, market structure has been the focus of much academic research. In many countries, the market exhibits an oligopolistic configuration, with few market suppliers, such as in the US (Zeff and Fossum, 1967; Rhode et al., 1974; o Kwon, 1996); New Zealand (Johnson et al., 1995); Hong Kong (Lee, 1994); the United Kingdom (Peel, 1997; Pong, 1999; Beattie et al., 2003 or Abidin et al., 2010); the Netherlands and Germany (Buijink et al., 1998); Belgium (Weets y Jeger, 1997) and Spain (García-Benau et al., 1998; Garcia-Ayuso and Sanchez, 1999; Carrera et al., 2005; Ruiz-Barbadillo et al., 2016). In these countries, the Big auditing firms supervise around 95% of the large customers. However, although the oligopolistic structure is the most common and deserving of research attention, the effects of an oligopolistic market structure on prices, earnings or innovation are difficult to predict (Bueno and Morcillo, 1993; Shepherd, 1990a; Pepall et al., 2008).

The audit market performance also merits research attention. Due to the difficulties in examining market interactions, many researchers explored market performance variables and inferred the strategy followed by audit firms. In this vein, there is a great bulk of literature that investigates audit fee behaviour and infers audit

market conduct. Within this body of research, we find rich empirical evidence on three predominant issues. The first concerns whether there is a discount fee in the initial years of the engagement (*lowballing* or *price cutting*) that might be signalling high competition among audit service suppliers (Francis, 1984; Palmrose, 1986b; Francis and Simon, 1987; Simon and Francis, 1988; Pearson and Trompeter 1994; Walker and Casterella, 2000).

The second issue is the identification of an audit fee premium that is generally attributable to the high quality of the services provided by the Big auditing firms (Simunic, 1980; Francis and Stokes, 1986; Chan et al., 1993; Johnson et al., 1995; Craswell et al., 1995; DeFond et al., 2000; Peel and Robert, 2003; Carson et al., 2004).

Finally, the third recurrent issue is the relationship between audit fees and audit product differentiation through specialization in a certain industry. Typically, auditor industry specialization is measured through the auditor's market share. The reason for using market share is that under the assumption of market competition, in the long term the largest portion of a certain industry's turnover is attributable to the best service provider, i.e. the specialized auditor at a national level (Craswell et al., 1995; DeFond et al., 2000); at the city/office level (Ferguson et al., 2003; Hay and Jeter, 2011); at the engagement partner level (Zerni, 2012) or at both national and city levels (Francis et al., 2005).

However, a limited number of studies have examined the effect of market structure on audit fees. McMeeking et al. (2007) revealed that market concentration is associated with higher fees. Hay and Knechel (2010) found that audit fees decrease when the competition among audit firms is more aggressive. Ciconte et al. (2015), using an audit firm's proprietary data on audit engagements, demonstrated that market concentration and market share are positively associated with the level of fees but not with the level of auditor effort. Hence, they conclude that market structure influences

audit fees and audit profitability but not audit costs, meaning that the Dutch audit market works as a Cournot oligopoly.

The main contributions about the interaction of the market structure with the remaining elements of the audit market are basically framed in the SCP paradigm (Yardley et al., 1992; Beattie et al., 2003). However, as Abidin et al. (2010) pointed out, the traditional static view of the SCP paradigm has been overtaken by a dynamic and endogenous view, where the market performance (profitability) may also influence market structure.

Additionally, some authors have tested the RMP hypothesis (Berger, 1995; Tregenna, 2009; Mirzaei et al., 2013) in the banking industry, under which market performance is determined by the company's market share and not by the level of market concentration.

However, evidence from the service industries about the relationship between market structure and profitability is still scarce. The banking industry provides some empirical insights (Berger, 1995; Tregenna, 2009; Mirzaei et al., 2013). Berger (1995) concluded that the merger activity in the banking industry is due to firms' pursuit of higher profitability by increasing their market share through differentiated products (supporting the RMP hypothesis). In contrast, Mirzaei et al. (2013) documented mixed evidence when the SCP and RMP hypotheses were tested in advanced/emerging banking systems. While banks in advanced economies can gain extra profits by increasing their market share and, therefore, exercise their market power (RMP hypothesis), for banks in emerging economies, the profitability models support neither the RMP nor the SCP hypothesis.

Although there are certain parallels between the banking and the audit markets—due to the ongoing concerns about merger activity, increasing concentration ratios and the regulatory implications—there is still scarce evidence on the audit industry. Lee (2012) and Ciconte et al. (2015) identified characteristics related to the

market structure that have a significant influence on audit performance. Ciconte et al. (2015) showed a positive influence of market structure (concentration) on audit profitability for one Dutch audit firm. Lee (2012) reported a positive effect of both concentration and market share on profitability for accounting firms in Taiwan.

Regarding the influence of market conduct variables on market performance, Lee (2012) found that merger activity and advertising expenses are significant drivers of audit profits. However, audit firm size presents a negative association with profits, suggesting operational inefficiencies in the largest audit firms in the Taiwan market. In Ciconte et al. (2015), client size was particularly significant in explaining the market concentration–profitability relationship. At the same time, the authors suggested that future research should investigate the effect of elements such as industry expertise, product differentiation and auditor reputation on audit profitability.

None of those prior studies tests the SCP and RMP hypotheses. Hence, testing the relationship between market variables in the audit market remains a pending research issue. Moreover, the RMP hypothesis, i.e. firms earn extra profits as a result of their market share obtained through product differentiation (Shepherd, 1982) has not been tested so far in the audit market.

Then, by using industrial organization theory in the auditing industry, we outline our first research question:

RQ1: Does the SCP paradigm or the RMP hypotheses prevail in the Spanish audit market?

Our period of study covers the implementation of the International Financial Reporting Standards (IFRS). In Spain, the IFRS adoption was a two-step process: the first took place in 2005, when, in accordance with European Regulation 1606/2002, the consolidated accounts of listed companies had to be formulated according to the international standards. The second phase started in 2008, when the domestic accounting regime adapted the IFRS for individual accounts, through a new *Plan*

General de Contabilidad (PGC)[23]. De Fuentes and Sierra-Grau (2015) empirically document abnormally high audit fees in 2004, 2005 and 2006 (around the first stage of the IFRS adoption) and in 2008, when the new General Accounting Plan became compulsory. However, whether those unexpectedly high audit fees are the consequence of higher audit costs or they lead to higher profitability is still a matter of investigation. To address this issue, we formulate the following research question:

RQ2: Is the implementation of IFRS associated with an unexpected variation in audit firm profitability?

5.3. Research design

5.3.1. Sample

To capture not only the influence of market structure and conduct variables but also the effect of the accounting reforms on market performance, we split the period of analysis (2003-2010) into two sub-periods. To explore the influence of the IFRS adoption for the consolidated accounts of listed companies, the first sub-period of study starts in 2003 and ends in 2007. In this case, the experimental sample consists of audit firms that supervise the consolidated accounts of listed companies and, therefore, had to implement IFRS in 2005. The control sample comprises audit firms that supervise the group accounts of non-listed companies following national accounting standards.

The second sub-period of analysis (from 2006 to 2010) refers to the second accounting reform, which was compulsory for all individual accounts, i.e. the adapted IFRS through the PGC. Therefore, we cannot make a control sample, because all individual accounts followed the new accounting regime. Nevertheless, to provide additional insights, we have identified whether the audit firm belongs to the Big 4 group, to capture the effect of the new PGC on audit firms' profitability according to audit firm size.

[23] In English: General Accounting Plan

To properly identify the *active* audit market (only audit firms that were undertaking audit services and not merely providing consultancy services) we build our sample from the auditees' information. Initially, we draw from the SABI[24] database all the Spanish firms with consolidated financial statements during the 2003-2007 period and those with individual financial statements for the 2006-2010 period. Then, we identify the audit firms that supervised those financial statements. Thus, we include the whole population of active audit firms during our periods of analysis.

Panel A of Table 5.1 summarizes the selection process for the audited group accounts. We exclude: (1) companies not subject to audit; (2) companies without information about their audit firm; (3) companies without available financial information on their audit firm; (4) observations with missing audit firms in any year of our period of analysis. In all, we get a sample of 986 audited groups (4,546 auditee-year observations). Next, using information provided by the same database, we identify the audit firms that supervised consolidated accounts. Panel B of Table 5.1 shows the resulting final sample of 230 audit firms; 18 of those supervised IFRS group accounts while 212 supervised national group accounts during the period 2003-2007.

Table 5.1. Sample of audited consolidated accounts and their audit firms from 2003 until 2007

Panel A: Audited consolidated accounts

	Auditees	**Auditee-year observations**
Spanish companies with audited consolidated financial statements	1,036	5,180
Less companies without information about their auditors	-35	-175
Less companies without available auditor's financial information	-15	-75
Less observations from companies with missing audit firms in any year		-384
Total sample of audited group accounts	**986**	**4,546**

[24] SABI: *Sistema de Análisis de Balances Ibéricos*. In English, Iberian Balance Sheet Analysis System

Panel B: Audit firms

	Audit firms	Audit firm-year observations
Audit firms of listed groups	18	66
Audit firms of non-listed groups	212	912
Final sample of audit firms	**230**	**978**

Panel A of Table 5.2 displays the selection process for the individual accounts. By following similar exclusion criteria as we did with consolidated accounts, we get a final sample of 27,290 audited individual accounts (91,787 firm-year observations), from 2006 to 2010. As depicted in Panel B of Table 5.2, we identified 976 audit firms that supervised the annual accounts. Audit firms that supervise group accounts tend to supervise the individual accounts of the parent company as well, thus the final sample comprises all audit firms with available information during the period of analysis.

Table 5.2. Sample of audited individual accounts and their audit firms from 2006 until 2010

Panel A: Audited individual accounts

	Auditees	Auditee-year observations
Spanish companies with audited individual accounts	441,920	2,209,600
Less companies with consolidated financial statements	-1,328	-6,640
Less companies no subject to audit works	-406,511	-2,032,555
Less companies without information about their auditors	-5,137	-25,685
Less companies without available financial information on their auditor	-1,654	-8.,270
Less observations on companies with missing audit firms in any year		-44,663
Total sample of audited individual accounts	**27,290**	**91,787**

Panel B: Audit firms

	Audit Firms	Audit firm-year observations
Final sample of audit firms	976	3,621

5.3.2. Method and models

To test the SCP paradigm and the RMP hypothesis with respect to the Spanish audit market, we first estimate a panel model following similar studies on the banking and auditing industries (Berger, 1995; Tregenna 2009; Lee, 2012; Mirzaei et al., 2013; Ciconte et al., 2015), where profitability is explained by market structure as described in the following equation (1):

$$P_{it}=\mathrm{f}(MS_{it}, MCit,\ AR_{it}) \quad (1)$$

In this model, we estimate performance (*P*) of the i*th* audit firm in the t period of time, as a function of market structure (*MS*), market conduct (*MC*) and accounting reforms (*AR*) variables. Our test variables associated with market structure are the concentration ratio (*CR4*) and the market share of each audit firm (*MKS*). We also analyse the effect of the natural log of the number of audit firms (*LNSUP)* as an indicator of the degree of entry barriers.

5.3.2.1. The empirical model for audit firms of group of accounts

Building on the above expression, we first develop the following equation for audit firms of group accounts, which includes a variable *(LIST)* to capture the effect of the first accounting reform, the IFRS adoption, for group accounts of listed companies in 2005:

$$ROA_{it}=\alpha_0 + \beta_1 LNSIZE + \beta_2 CR4 + \beta_3 MKS + \beta_4 LNAGE + \beta_5 LNSUP + \beta_6 RSTAFF + \beta_7 SPEC + \beta_8 MERGER + \beta_9 LIST + \varepsilon \quad (2)$$

where,

ROA = the audit firm's profitability, measured through the ratio of income from ordinary activities to total assets

LNSIZE = natural log of the audit firm's total assets

CR4 = Market share accounted for by the four largest audit firms, measured on the basis of the proportion of total client assets audited by the four largest firms

MKS = Market share accounted for by the audit firm, expressed as the proportion of total client assets audited by an audit firm

LNAGE = natural log of number of years since the audit firm was established

LNSUP = natural log number of suppliers, i.e. audit firms

RSTAFF = ratio of the audit firm's staff expenses to its operating expenses

SPEC = dummy variable equal to 1 if the audit firm´s market share in a certain industry is above 20%, and 0 otherwise

MERGER = dummy variable equal to 1 if the firm has acquired another audit firm by absorption, total split-off or global transfer of assets and liabilities; and 0 otherwise

LIST = dummy variable equal to 1 if the audit firm supervises a listed group

Our dependent variable is the ratio of income from ordinary activities to total assets (ROA), because it is a common measure of profitability (Berger, 1995; Tregenna, 2009; Mirzaei et al., 2013, among others).

As independent variables, we include measures to control for relevant market structure and firm conduct factors selected on the basis of previous industrial organization research as well as studies in the auditing field (Lee, 2012; Hay et al., 2006a).

To approach market structure issues, we estimate the audit firm's market share (*MKS*) and the four biggest audit firms' concentration ratio (*CR4)*. Although the appropriate measure of a company's market share is based on the turnover generated by the company and by the market as a whole, due to the lack of information in this case, we turn to the empirical literature, which offers several alternative approaches, such as the number of audit reports or number of clients (García-Ayuso and Segura, 1999 or Carrera et al., 2005). Audit firm revenues come from different business segments (auditing and a wide variety of consultancy services); consequently, due to

the lack of specific information, instead of total audit firm revenues, we use the assets of the client audited by the firm, which is a good surrogate for audit fees because they are highly correlated (Hay et al., 2006a; Hay, 2013; De Fuentes and Sierra, 2015). Furthermore, Ciconte et al. (2015) documented that client size is a significant driver of the relationship between market concentration and profitability.

The size of the firms in an industry is usually computed with the logarithm of total assets of the companies (*LNSIZE*). As pointed out by Mirzaei et al. (2013), a positive relationship between firm size and profitability is indicative of the presence of economies of scale, whereas a negative one represents scale inefficiencies due to the agency or overhead costs related to larger companies. Britton et al. (1992) emphasized that service industries are labour intensive with low fixed costs, where certain characteristics relating to the specific nature of the product have an important impact on the SCP approach. Furthermore, difficulties in accessing the information needed make it more difficult to document specific firms´ structure and conduct features.

As an additional firm structure variable, we have included the number of years since the audit firm was established (*LNAGE*) as a proxy of the viability and experience of the firm (Bröcheler et al., 2004).

As stated by Ruiz-Barbadillo et al. (2016), the complexity of some sectors and the specialization required to audit them hinder the access of small audit firms without the necessary resources or the optimal size. Therefore, following Ruiz-Barbadillo et al. (2016), we use the natural log of the number of audit firms in the market (*LNSUP*) as an indicator of the entry barrier conditions. A significant negative relationship implies that the higher the number of audit firms in the market, the lower the barriers, since more audit firms meet the entry requirements, which increases market competitiveness and has a negative effect on overall returns.

As conduct variables, we have included a dichotomous variable to register the effect of mergers (*MERGER*), the staff expenses to operating expenses ratio (*RSTAFF*) and an indicator of the audit firm specialization (*SPEC*). Mergers allow audit firms to increase their size, which can help them to achieve economies of scale that may result in higher profits. Given that the audit sector is a labour-intensive industry (Britton et al., 1992), *RSTAFF* is a suitable indicator of the degree of resources allocated to the most important production factor of an audit firm, and thus also provides an understanding of how efficiently the company works. More efficient audit firms will assign more of their expenses to employee compensation than to other expenses. Finally, auditor specialization (*SPEC*) is a good proxy of the specific knowledge and expertise in a certain industrial sector. We have operationalized auditor industry specialization through the market share; the reason for this is that, under the assumption of market competition, in the long term the largest portion of a certain industry's turnover is attributable to the best service provider, i.e. the specialized auditor. We measure *SPEC* through a dichotomous variable that represents whether the audit firm has a market share above 20% (Craswell et al., 1995; DeFond et al., 2000, among others).

Finally, as stated above, we also address the overall effect of the new accounting framework, the first stage of which consisted of the IFRS implementation for the group accounts of listed companies. To capture this effect on the audit firm's profitability, we include a dummy variable (*LIST*) to identify which audit firms have supervised listed groups.

5.3.2.2. The empirical model for audit firms of individual accounts

Next, to identify the main drivers of audit firm profitability during the second stage, comprising the adaptation of the IFRS through the PGC, we specify a second model aimed at analysing those audit firms entrusted with the supervision of individual accounts from 2006 to 2010:

$$ROA_{it}=\alpha_0 + \beta_1 LNSIZE + \beta_2 CR4 + \beta_3 MKS + \beta_4 LNAGE + \beta_5 LNSUP + \beta_6 RSTAFF + \beta_7 SPEC + \beta_8 MERGER + \beta_9 BIG4 + \varepsilon \quad (3)$$

This model includes the same test and control variables as in equation (2), with the exception of *LIST*, because all individual accounts are reported under the new PGC, regardless of whether they refer to listed or non-listed companies. Additionally, we explore the influence of the auditor´s reputation, measured through the dummy variable *BIG4* (Hay et al., 2006a, Hay 2013) on the audit firm's profitability.

In this case, we cannot build a control sample because, as stated above, all individual accounts have been reported under the same domestic accounting regime. Thus, to estimate the potential effect of the accounting reform, we develop a profitability expectation model (similar to Menon and Williams, 2001; De Fuentes and Sierra-Grau, 2015) by using 2006 as the benchmark year. We estimate the predicted profitability of each audit firm during the whole period of study had the accounting reform not taken place and estimate the higher (lower) percentage variation between the current and the expected profitability. This equation is calculated as follows:

$$exp\big(ROA - E(ROA|adapted\ IFRS = 0)\big) - 1 \quad (4)$$

where *ROA* is the return on assets variable and $E(ROA|adapted\ IFRS = 0)$ is the predicted ROA using the 2006 model as the fee expectation model. Equation (4) measures the greater (lower) percentage of ROA with regard to the expected ROA and is equivalent to calculating the difference between the actual ROA and the predicted value (*PROA*) and dividing the resulting value by the predicted ROA, as depicted in Equation (5).

$$ROA\ \ abnormal = \ (ROA - PROA)/(PROA) \quad (5)$$

5.4. Results

5.4.1. Evolution of the variables of interest

As stated above, in Spain, the IFRS implementation triggered unexpected increases in audit fees that might impact on the audit firms' profitability (De Fuentes and Sierra, 2015). Therefore, we first analyse the evolution of the structure and profitability ratios for two different periods of time and client segments[25]: a) audit firms entrusted with the supervision of consolidated financial statements from 2003 to 2007 (Figures 5.1, 5.2 and 5.3); and b) audit firms of individual financial statements from 2006 to 2010 (Figures 5.4, 5.5 and 5.6).

Figure 5.1 displays the evolution of the return on investment ratio (ROA) over our period of analysis. Audit firms of non-listed groups exhibit higher performance ratios than audit firms of listed groups, and the values are more stable, remaining around 12-14%. Conversely, the profitability values of audit firms of listed groups show a decreasing trend from 2003, with ROA falling from 12% to 4% in 2007, except for a brief rise in 2005.

Like most international audit markets, Spain is a highly-concentrated market dominated by the Big 4 (Carrera et al., 2005) and this concentration of market share in the hands of the Big 4 audit firms (CR4) shows an upward trend from 2004 for audit firms of consolidated financial statements, rising from 91% to 93% (see Figure 5.2). Similarly, the average market share of audit firms of consolidated accounts also displays a sharp upward turn from the same year (Figure 5.3).

[25] Section 5.3.1. explains the selection procedure for variables and samples.

Figure 5.2. Profitability of audit firms of consolidated accounts (ROA %) for the period 2003 - 2007

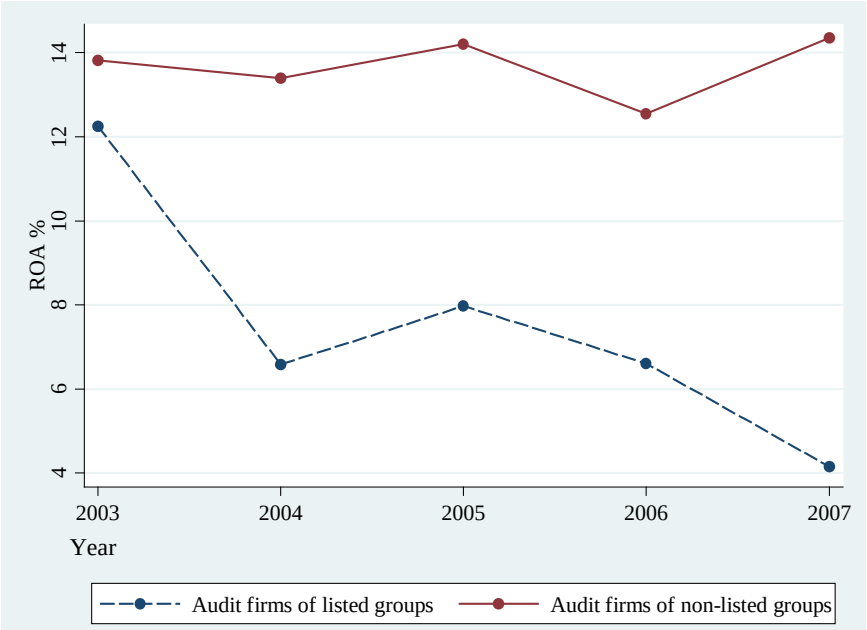


Figure 5.1. Concentration ratio of audit firms of consolidated accounts (CR4) for the period 2003 - 2007

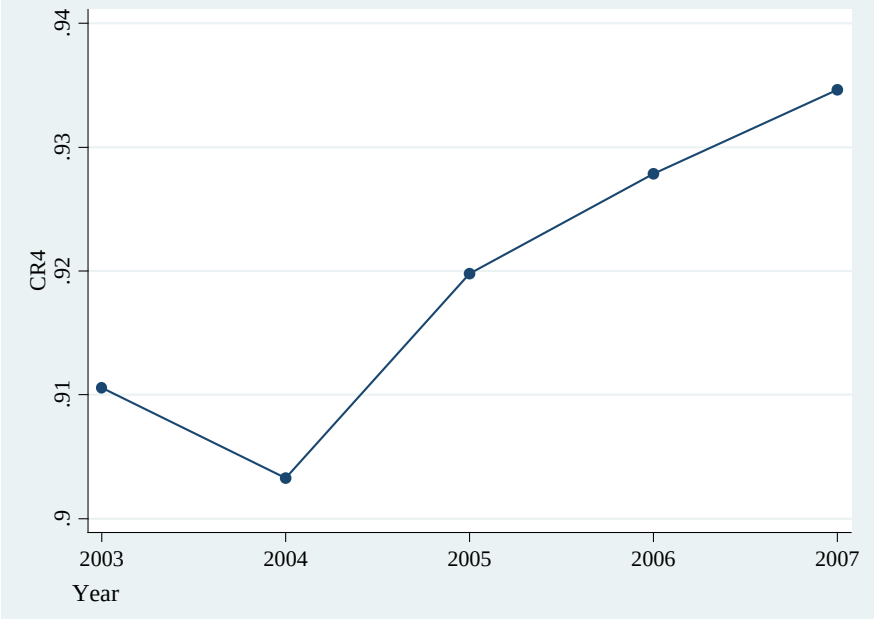
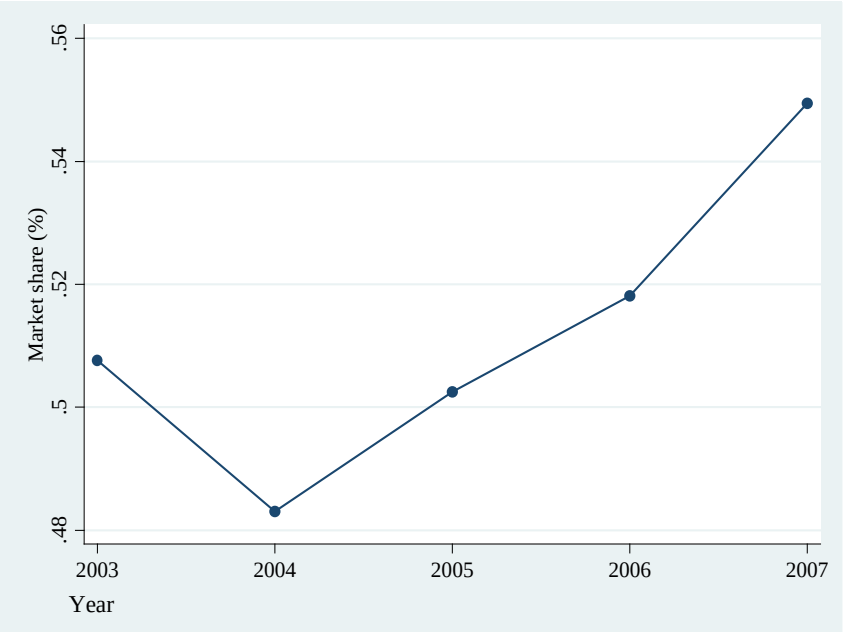
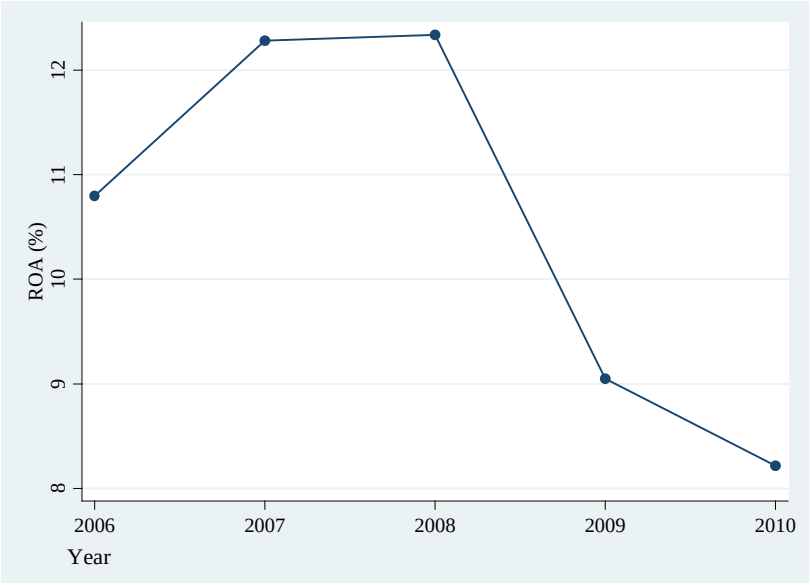


Figure 5.3. Market share of audit firms of consolidated accounts for the period 2003 - 2007



As for audit firms of individual companies, audit firm profitability (measured through ROA) shows a considerable reduction during the 2006-2010 period, from 12% to 8% (see Figure 5.4).

Figure 5.4. Profitability of audit firms of individual accounts (ROA %) for the period 2006 - 2010



The market share of individual accounts in the hands of the Big 4 (CR4) increases from 83% to 86% over our period of analysis, but with a drop in 2009 (see Figure 5.5). Conversely, Figure 5.6 exhibits a decline in audit firms' market share from 2006 to 2010.

Figure 5.6. Concentration ratio of audit firms of individual accounts (CR4) for the period 2006 - 2010

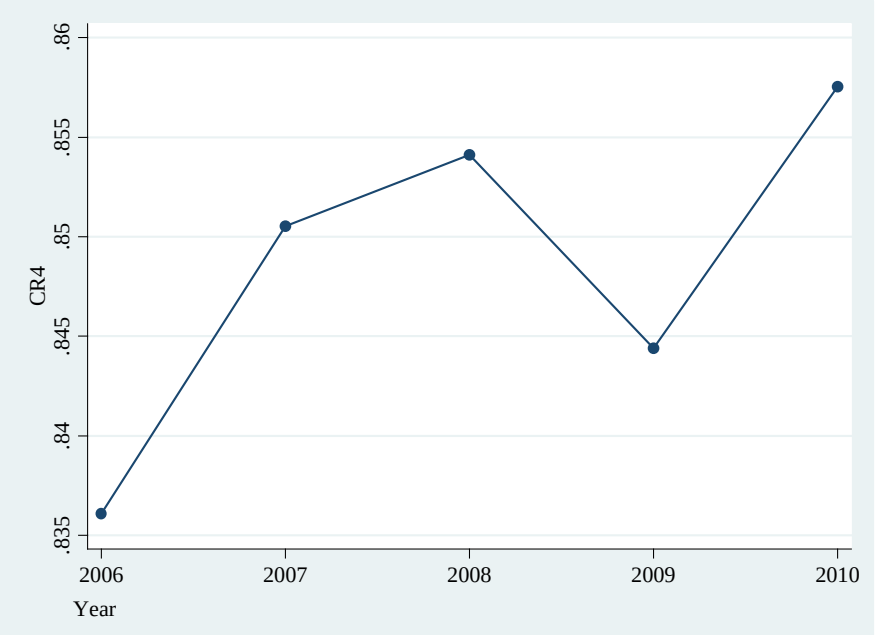
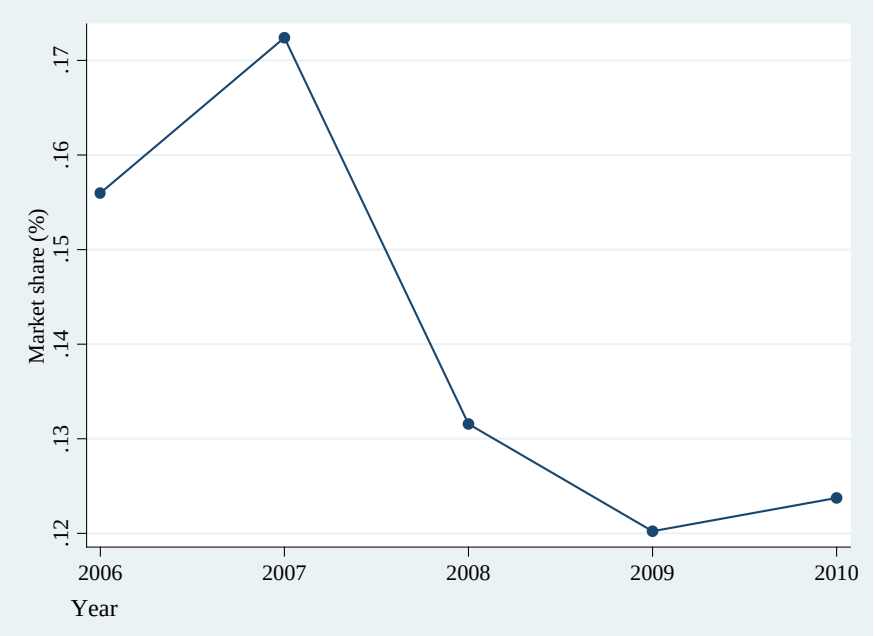


Figure 5.5. Market share of audit firms of individual account for the period 2006 - 2010



Differences observed between the auditors of consolidated and individual statements in terms of market structure and profitability reinforce the idea of investigating the two segments separately. Furthermore, by separating audit firms of consolidated statements from those of individual financial statements, we can isolate the effect of the new accounting reforms (IFRS in 2005 and the adapted IFRS in 2008) on each group.

5.5. Descriptive statistics

In Table 5.3, we report descriptive statistics for the period 2003-2007. As shown in Panel A, variables representing audit firm characteristics, such as *SIZE* and *AGE*, show high variation across the sample, which suggests our sample includes a wide variety of audit firms. This variation becomes more evident in Panel B of Table 5.3, where we also summarize statistics after dividing our sample into audit firms of listed and non-listed groups. The distributions of *ROA* and *SIZE* are skewed, even at the identified level of type of audit firm. As expected, a comparison between mean values indicates that listed clients demand larger audit firms (*SIZE*) and greater specialization (*SPEC*). In addition, these audit firms are usually characterized by larger market share (7.02%), longer experience in auditing (16 years) and greater merger activity (10.6%). Not surprisingly, this classification includes the Big 4 firms. However, we note that audit firms of listed groups present lower mean values for profitability (0.078) and lower ratio of investment in staff expenses to operating expenses (0.440) than audit firms of non-listed groups (0.137 and 0.467, respectively).

Table 5.3. Descriptive statistics (thousand €s) for the sample of audit firms of consolidated accounts 2003 – 2007

Panel A. Total sample (*N*=978)

Variables	Mean	Median	Min	Max	Std	Mean (winsorized)
ROA	0.133	0.075	-1.282	1.085	0.214	0.134
SIZE	1753.443	225.015	2.165	210427	11231.980	1290.378
CR4	0.919	0.920	0.903	0.935	0.011	
MKS	0.005	0.000	0	0.560	0.040	0.004
AGE	14.405	15	1	79	7.811	14.164
NSUP	195.943	197	182	207	8.121	195.943
RSTAFF	0.465	0.481	0	0.989	0.240	0.465
SPEC	0.008					
MERGER	0.015					
LIST	0.067					

Panel B: Specific variables by type of audit firms

	Audit firms of listed groups (n=66)			Audit firms of non-listed groups (n=912)		
Variables	Mean	Median	Std	Mean	Median	Std
ROA	0.078	0.052	0.122	0.137	0.078	0.219
SIZE	20222.670	2717.849	38959.080	416.854	206.108	706.999
MKS	0.072	0.003	0.137	0.000	0.000	0.001
AGE	16.197	17	5.367	14.275	15	7.945
RSTAFF	0.440	0.424	0.203	0.467	0.484	0.243
SPEC	0.121			0		
MERGER	0.106			0.009		

Variable definitions: *ROA*: ratio of income from ordinary activities to total assets*; SIZE*: total assets, measured in thousand €s; *CR4*: market share of the four largest firms; *MKS*: market share of a firm; *AGE*: number of years since the audit firm was established; *NSUP*: number of suppliers; *RSTAFF*: ratio of the audit firm's staff expenses to its operating expenses; *SPEC*: dummy variable coded 1 if the audit firm´s market share in a certain industry is above 20%, and 0 otherwise; *MERGER*: dummy variable coded 1 if the firm has acquired another audit firm by absorption, total split-off or global transfer of assets and liabilities, and 0 otherwise ; *LIST*: dummy variable coded 1 if the audit firm supervises listed groups, and 0 otherwise.

Table 5.4 displays descriptive statistics for the period 2006-2010. As with the preceding period, the distribution of the variables shows a large variation, as a result of having a wide range of audit firms in the sample. Mean and median values are lower than those displayed in Panel A of Table 5.3, because the sample includes not only audit firms of consolidated statements but also of individual accounts.

In Panel B of Table 5.4, we differentiate between Big 4 and non-Big 4 to provide a more comprehensive insight into each segment of our sample. Similar to the 2003-2007 sample, the Big 4 have higher market share (21.2%) and larger mean size (95, 479, 480 €). Also, compared with the non-Big 4 group, they have a higher level of specialization (45%) and undergo more merging (5%). On the contrary, they exhibit a lower level of profitability (0.022) and proportion of staff expenses relative to operating expenses (0.353) than non-Big 4 (0.104 and 0.409, respectively).

Table 5.4. Descriptive statistics (thousand €s) for the sample of audit firms of individual accounts over 2006 – 2010

Panel A. Total sample (*N*=3,621)

Variables	Mean	Median	Min	Max	Std	Mean (winsorized)
ROA	0.104	0.061	-5.589	9.374	0.336	0.105
SIZE	842.450	136.563	0.089	256857	9074.549	329.618
CR4	0.849	0.851	0.836	0.858	0.008	
MKS	0.001	0.000	0	0.375	0.017	0.000
AGE	14.265	15	1	82	7.320	14.185
NSUP	737.357	760	580	832	94.295	737.357
RSTAFF	0.409	0.429	-14.380	12.585	0.406	0.409
SPEC	0.002					
MERGER	0.004					
BIG4	0.004					

Panel B: Specific variables by type of audit firms

	Big 4 (n=20)			Non-Big 4 (n=3601)		
Variables	Mean	Median	Std	Mean	Median	Std
ROA	0.022	0.002	0.053	0.104	0.062	0.337
SIZE	95479.480	56868.810	78223.180	316.835	135.168	691.430
MKS	0.212	0.178	0.094	0.000	0.000	0.001
AGE	20.750	21	1.682	14.229	15	7.324
RSTAFF	0.353	0.367	0.220	0.409	0.430	0.407
SPEC	0.450			0		
MERGER	0.050			0.004		

Variable definitions: *ROA*: ratio of income from ordinary activities to total assets*; SIZE*: total assets, measured in thousand €s; *CR4*: market share of the four largest firms; *MKS*: market share of a firm; *AGE*: number of years since the audit firm was established; *NSUP*: number of suppliers; *RSTAFF*: ratio of the audit firm's staff expenses to its operating expenses; *SPEC*: dummy variable coded 1 if the audit firm´s market share in a certain industry is above 20%, and 0 otherwise; *MERGER*: dummy variable coded 1 if the firm has acquired another audit firm by absorption, total split-off or global transfer of assets and liabilities, and 0 otherwise ; *BIG4*: dummy variable coded 1 if the audit firm belongs to the Big 4 group, and 0 otherwise.

To limit the effect of extreme values, we use for both samples the log of size, age and the number of suppliers in the regressions that follow. We also split our samples according to the quartiles of the variables of profitability and size to use them as thresholds: first, for the most/least profitable audit firms and second, after accounting for firm size.

5.5.1. Univariate results

In Tables 5.5 and 5.6, we provide the results of the univariate analyses for profitability based on specific attributes of audit firms (Panel A) and for the overall market structure, differentiating between the period before and after IFRS and NPGC (Panel B).

In Panel A of Table 5.5, we report significant variations in the mean and median values of the audit firm returns for the period 2003–2007 with respect to some audit firm characteristics, for both the whole sample and the subsamples. The

Wilcoxon signed-rank test and the nonparametric median test show that resources allocated to specialization and mergers are associated with lower profitability ratios than audit firms that are neither specialized nor merged. Conversely, investments in staff are positively associated with audit firm returns. This evidence does not apply to audit firms of non-listed groups, for which the only significant differences in profitability are those due to variations in staff expenses. Relating to our first research question, we note that market structure affects profitability, since market share and firm size are negatively associated with *ROA* in the subsample of listed groups. These results reveal an unexpected opposite relationship between size and auditors´ profitability.

Additionally, Panel B of Table 5.5 displays a significant increase in market concentration after the implementation of IFRS, consistent with a downward trend in the number of audit firms (the mean value of LNSUP decreases from 5.309 to 5.234), which could alter overall market structure and influence returns.

Table 5.5. Univariate analysis. Period 2003 - 2007

Panel A. Wilcoxon and median difference tests for ROA by audit firm characteristics

		Total sample 2003-2007		Audit firms of listed groups		Audit firms of non-listed groups	
Variables		n	Mean (Median)	n	Mean (Median)	n	Mean (Median)
LNSIZE							
	Higher	489	0.115 (0.074)	33	0.034 (0.011)	456	0.122 (0.078)
	Lower	489	0.151 (0.082)	33	0.122 (0.086)	456	0.151 (0.080)
	Wilcoxon test (median test)		-1.020 (0.102)		-4.123*** (13.636)***		-0.411 (0.000)
MKS							
	Higher	489	0.124 (0.069)	33	0.034 (0.011)	456	0.132 (0.075)
	Lower	489	0.141 (0.083)	33	0.122 (0.086)	456	0.141 (0.082)
	Wilcoxon test (median test)		-1.249 (2.164)		-4.123*** (13.636)***		-0.614 (0.281)
LNAGE							
	Higher	544	0.135 (0.074)	41	0.069 (0.043)	493	0.142 (0.078)
	Lower	434	0.129 (0.076)	25	0.092 (0.053)	419	0.130 (0.078)
	Wilcoxon test (median test)		0.550 (0.000)		-1.091 (0.580)		0.984 (0.004)
RSTAFF							
	Higher	489	0.160 (0.098)	33	0.103 (0.086)	456	0.165 (0.099)
	Lower	489	0.105 (0.056)	33	0.054 (0.029)	456	0.109 (0.063)
	Wilcoxon test (median test)		4.374*** 16.233***		2.571* (7.333)**		3.934*** (11.860)**
SPEC							
	Yes	8	0.015 (-0.003)	8	0.015 (-0.003)		
	No	970	0.134 (0.076)	58	0.087 (0.060)		
	Wilcoxon test (median test)		-3.015** (4.537)*		-3.026** (5.121)*		
MERGER							
	Yes	15	0.008* (0.021)	7	0.025+ (0.008)	8	-0.007 (0.069)
	No	963	0.135 (0.076)	59	0.084 (0.053)	904	0.138 (0.078)
	Wilcoxon test (median test)		-2.455* (1.693)		-1.947+ (1.438)		-1.329 (0.000)

Test of significance: *** < 0.001, ** < 0.01, * <0.05, + <0.10

Panel B. Wilcoxon and median difference tests for CR4 and LNSUP before and after the IFRS implementation in 2005

Variables		Pre-IFRS[a] (n=404)	Post-IFRS[a] (n=375)	Wilcoxon test	Nonparametric median test
CR4					
	Mean	0.907	0.931	-24.936***	
	Median	0.903	0.928		779.000***
LNSUP					
	Mean	5.309	5.234	24.936***	
	Median	5.333	5.263		261.675***

Test of significance: *** < 0.001, ** < 0.01, * <0.05, + <0.10
[a] Comparison between the pre-IFRS period (2003 and 2004) and the post-IFRS period (2006 and 2007).

In Panel A of Table 5.6, we provide univariate evidence of positive and significant associations of audit firm performance (ROA) for the period 2006-2010 with size, market share and merging activity for non-Big 4 companies. As mentioned above with auditors of listed groups, Big 4 returns are associated negatively with market share and specialization, with the ratio of staff expenses being the only variable that shows the same significant and positive direction for both market segments. De Fuentes and Sierra-Grau (2015) found a positive association between auditor industry specialization and audit fees although, in light of these univariate results, it would not fully offset all the additional costs the auditor incurs in acquiring specific industrial knowledge. Panel B also displays an increase in market concentration following the implementation of the new accounting regulation. Nevertheless, we do not observe a reduction in the number of audit firms during the period of analysis.

This univariate evidence supports the effect of market structure on audit firm returns and also lays the ground for further analysis seeking a better understanding of the decisive role it plays in profitability.

Table 5.6. Univariate analysis. Period 2006 -2010

Panel A. Descriptive statistics of profitability (ROA) by audit firms characteristics

		Total sample 2006-2010		Big 4		Non-Big 4	
Variables		n	Mean (Median)	n	Mean (Median)	n	Mean (Median)
LNSIZE							
	Higher	1811	0.134 (0.066)	10	0.026 (0.003)	1801	0.115 (0.067)
	Lower	1810	0.094 (0.059)	10	0.019 (0.002)	1800	0.094 (0.059)
	Wilcoxon test (median test)		3.301** (2.492)		-0.680 (0.000)		3.603*** (2.722)+
MKS							
	Higher	1811	0.119 (0.072)	10	0.013 (-0.001)	1800	0.120 (0.072)
	Lower	1810	0.088 (0.052)	10	0.032 (0.010)	1801	0.089 (0.052)
	Wilcoxon test (median test)		6.048*** (16.307)***		-2.041* (3.200)+		6.053*** 17.775***
LNAGE							
	Higher	1831	0.093 (0.057)	7	0.031 (0.001)	1811	0.094 (0.059)
	Lower	1790	0.115 (0.066)	13	0.018 (0.007)	1790	0.115 (0.066)
	Wilcoxon test (median test)		-2.025* (2.598)		-0.198 (0.220)		-1.742+ (1.646)
RSTAFF							
	Higher	1810	0.123 (0.075)	10	0.044 (0.019)	1800	0.124 (0.076)
	Lower	1811	0.084 (0.048)	10	0.001 (-0.000)	1801	0.085 (0.049)
	Wilcoxon test (median test)		7.080*** (42.654)***		1.814+ (3.200)+		6.939*** (40.311)***
SPEC							
	Yes	9	0.014 (-0.001)	9	0.014 (-0.001)		
	No	3612	0.104 (0.062)	11	0.030 (0.009)		
	Wilcoxon test (median test)		-3.024** (5.454)*		-2.013* (1.818)		
MERGER							
	Yes	16	0.145 (0.096)	1	0.001 (0.001)	15	0.154 (0.099)
	No	3605	0.104 (0.061)	19	0.024 (0.002)	3586	0.104 (0.062)
	Wilcoxon test (median test)		1.370 (6.283)*		-0.087 (1.053)		1.710+ (8.107)**

Test of significance: *** < 0.001, ** < 0.01, * <0.05, + <0.10

Panel B. Descriptive statistics of overall market structure characteristics

Variables		Pre-NPGC[a] (n=1221)	Post-NPGC[a] (n=1640)	Wilcoxon test	Nonparametric median test
CR4					
	Mean	0.843	0.851	-24.567***	
	Median	0.836	0.844		0.874
LNSUP					
	Mean	6.416	6.709	-47.424***	
	Median	6.463	6.724		873.436***

Test of significance: *** < 0.001, ** < 0.01, * <0.05, + <0.10
[a] Comparison between the pre-NPGC period (years 2006 and 2007) and the post-NPGC period (years 2009 and 2010).

5.5.2. Multivariate results

5.5.2.1. Regression results

Empirical literature concerning the relationships among structure, conduct and market performance usually applies simultaneous equations to minimize endogeneity problems (Delorme et al., 2010). However, as stated by Schmalensee (1989), although panel data is better in a panel model scenario, it is difficult to obtain the appropriate number of valid instruments due to the fact that most of the variables employed in the model are endogenous. The more complex the model, the more difficult it is to find variables that meet the requirements. Furthermore, as pointed out by Mirzaei et al. (2013), although lagged variables of the regressors are usually used as instruments in these cases, when dealing with an unbalanced panel data set, the expected loss of degrees of freedom results in worse model performance.

Therefore, following Mirzaei (2013), in our modelling phase, we conduct the F-test and the Breusch-Pagan Lagrange multiplier test to examine fixed and random effects. When both hypotheses are rejected, we use the Hausman test to assess whether a fixed or random model fits better. We also examine the presence of heteroscedasticity and serial correlation with the Breusch-Pagan test and the Lagram-

Multiplier test. Finally, we estimate the random effect models employing a random effect GLS (Generalized Least Square) regression. For fixed effects, Mirzaei (2013) opts for a Least Square Dummy Variable procedure (LSDV), but multicollinearity problems prevent us from using it here. In the robustness section, we try to alleviate the endogeneity problem with further analyses.

Table 5.7 and Table 5.8 report the results by quartiles of audit firms´ profitability (ROA) for the two client segments, group accounts for 2003 to 2007 and individual accounts for 2006 to 2010, respectively. For the sake of comprehensiveness, in the last column of both tables, we also present the results for the full samples.

Following our research questions, our first objective is to answer *RQ1*, that is, whether we can apply the SCP paradigm or the RMP hypothesis to the audit market (results displayed in Table 5.7). As for the total sample, only the variable *RSTAFF*, that is the ratio of staff expenses to operating expenses, is positively associated with audit firms' ROA.

When dividing the sample into quartiles, the model performs better for the lowest and highest quartile of both samples, with higher R^2 values than those of the other quartiles, and higher than the figure provided by Lee (2012) in the Asian audit market (4.10% for the ratio of net incomes to fixed assets). However, results regarding the first quartile are not robust because the F-statistic is not significant, which raises doubts about the validity of this model in the period 2003-2007 for audit firms in the bottom segment of profitability. We have also noticed that the performance of these models ranges widely between sectors and time periods. For example, in the banking sector, Mirzaei et al. (2013) report an *R*2 of around 60% or even over 70%. This evidence contrasts with previous figures provided by Berger (1995), where we cannot find an R^2 above 14% in any year between 1980 and 1989 (main regressions). As for the audit market, as previously indicated, Lee (2012) reports a poor performance of this model (4.10%) in comparison with the data provided by Ciconte et al. (2015),

with an R^2 above 30%. A plausible explanation for the better result in the audit field, could be the fact that Ciconte et al. (2015) measure profitability as the ratio of audit fees to total audit costs and this metric is normally associated with audit fee models (models characterized by high R^2).

Regarding the 4th quartile that contains, on average, the audit firms that have the highest ROA and that supervise mainly non-listed groups of companies (according to data presented in Figure 1), *LNSIZE* is negatively associated with *ROA* (coefficient of -0.056) as in Lee (2012). *LNSUP* also displays a negative and significant coefficient (-0.781), i.e. the number of suppliers has a negative influence on the ROA of the smallest audit firms, indicating the presence of entry barriers. *CR4* also displays negative and significant coefficients (-3.728), albeit at a weak level of significance (10%). Conversely, market share is significant and positive (coefficient of 3.043). These results are consistent with the trend perceived in Figure 1 and Figure 2, where, despite the increase in concentration (Figure 2), the most profitable audit firms are not the largest ones (Figure 1). Therefore, increased market share is indicative of greater returns, whereas concentration is associated with structural barriers that prevent small and mid-sized firms from becoming more profitable when they audit consolidated financial statements. Our findings are consistent with those reported by Ruiz-Barbadillo et al. (2016), which evidence the presence of high entry barriers in the 2003-2010 period.

Therefore, the evidence is more supportive of the relative market power (RMP) hypothesis than the collusion or SCP hypothesis. As pointed out by Shepherd (1982), market structure can be key to generating extra profits, through the exercise of market power arising from market share. Also, this raises the question of what is the optimal level of market share that provides extra returns to firms but allows competition in the market, without creating entry barriers.

Regarding the conduct variables, none of the audit firms included in the 4th quartile (highest profitability) has a market share greater than 20%, which is why we

could not regress the variable *SPEC*. Investment in staff resources plays a positive and significant role in boosting returns when audit firms are supervising group accounts (the coefficient is 0.171). Finally, contrary to our expectations, the insignificant coefficient for *LIST* in Table 5.7 is an indication that IFRS adoption did not have an impact on audit profitability. These results corroborate our initial univariate results and allow a fuller understanding of the findings presented by De Fuentes and Sierra-Grau (2015). The unexpectedly higher audit fees for group accounts of listed companies in 2005 did not lead to higher profitability ratios; a plausible explanation for this is the increased audit costs associated with supervising group accounts in accordance with the new international standards.

It is worth noting that, according to the results on audit firms of individual accounts depicted in Table 5.8, the F-statistic is missing in the second quartile, i.e. the tested variables do not significantly explain the levels of audit firm profitability. In the model regressed in the 4th quartile, we drop three dichotomous variables (*SPEC*, *MERGER* and *BIG4*) because the audit firms in this group had not merged with any other audit firms and we only have one observation for the BIG4 and three for the MERGER variable during the period of analysis. As with the findings from the group accounts, we find that the market share and RMP theory seems to prevail over the SPC paradigm. In fact, the concentration ratio is not significant in this case. The coefficient of market share is 2.095 although the level of significance is weak (10%).

Table 5.7. Profitability regression results by audit firms´ ROA threshold. Period 2003 – 2007
Client segment: Consolidated financial statements

	QUARTILE 1[a] [≤ 0.01508]		QUARTILE 2[b] [>0.01508; ≤0.07463]		QUARTILE 3[b] [>0.07463;≤0.20072]		QUARTILE 4[b] [>0.20072]		TOTAL[b]	
	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig
Intercept	0.358		0.582		0.384		8.099	*	1.863	
LNSIZE	0.029	**	0.001		-0.003	+	-0.056	***	-0.010	
CR4	-0.596		-0.248		-0.078		-3.728	+	-0.826	
MKS	-0.017		-0.109	***	-4.061	*	3.043	*	0.148	
LNAGE	0.017		0.003		-0.000		0.010		0.018	
LNSUP	-0.000		-0.061		-0.031		-0.781	+	-0.194	
RSTAFF	-0.128	*	0.003		0.005		0.171	*	0.136	*
SPEC	-0.007		-0.006	*	0.983	*			-0.029	
MERGER	-0.059		-0.003		-0.011	*			-0.085	
LIST	-0.099	+	0.004		-0.000		-0.022		-0.024	
R^2 (%)	7.57		3.16		4.46		12.50		3.20	
F-statistic	1.28									
Wald test			1321.84	***	62.10	***	25.94	***	17.49	*
N	244		245		245		244		978	

Notes: [a]OLS regression estimated using robust standard errors; [b] Random effect GLS regression estimated using robust standard error adjusted by clustering by firm. All p-values are two tailed. Test of significance of coefficients: *** < 0.001, **< 0.01, *< 0.05, + < 0.10 Variable definitions: *LNSIZE*: natural log of total assets; *CR4*: market share of the four largest firms; *MKS*: market share of a firm; *LNAGE*: natural log of number of years since the audit firm was established; *LNSUP*: natural log number of suppliers; *RSTAFF*: ratio of the audit firm's staff expenses to its operating expenses; *SPEC*: indicator variable equal to 1 if the audit firm´s market share is above 20%.; *MERGER*: indicator variable equal to 1 if the firm has acquired another audit firm by absorption, total split-off or global transfer of assets and liabilities; ; *LIST*: indicator variable equal to 1 if the audit firm supervises a listed group.

Table 5.8. Profitability regression results by audit firms´ ROA threshold. Period 2006 – 2010.
Client segment: Individual accounts (individual companies)

	QUARTILE 1[b] [≤ 0.01245]		QUARTILE 2[a] [>0.01245; ≤0.06147]		QUARTILE 3[b] [>0.06147;≤0.16934]		QUARTILE 4[a] [>0.16934]		TOTAL[c]	
	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig
Intercept	0.628		0.032		0.065		-0.981		0.320	
LNSIZE	0.120	***	-0.000		-0.002	+	-0.094	*	0.035	*
CR4	0.404		0.013		-0.007		1.000		0.316	
MKS	-0.780		-0.190		0.226		2.095	+	-0.900	+
LNAGE	-0.035		-0.001		0.002		0.034		-0.028	*
LNSUP	-0.043		-0.001		0.008		0.132		-0.089	*
RSTAFF	-0.039		0.002		-0.001	+	0.060		0.009	
SPEC	0.002		0.005		-0.022				0.088	
MERGER	-0.020		-0.010		0.001				0.015	
BIG4	-0.486	**	0.025						-0.135	
R^2 (%)	11.97		0.43		0.80		5.87		0.95	
F-statistic							1.91	+		
Wald test	62.46	***	.	.	216.07	***			84.66	***
N	906		905		905		905		3621	

Notes: [a]Linear regression estimated using robust standard errors adjusted by clustering by firm;[b] Random effect GLS regression estimated using robust standard error adjusted by clustering by firm; [c] Random effect GLS regression estimated using robust standard errors
All p-values are two tailed. Test of significance of coefficients: *** < 0.001, **< 0.01, *< 0.05, + < 0.10
Variable definitions: *ROA*: ratio of income from ordinary activities to total assets*; SIZE*: total assets, measured in thousand €s; *CR4*: market share of the four largest firms; *MKS*: market share of a firm; *AGE*: number of years since the audit firm was established; *NSUP*: number of suppliers; *RSTAFF*: ratio of the audit firm's staff expenses to its operating expenses; *SPEC*: indicator variable equal to 1 if the audit firm´s market share is above 20%.; *MERGER*: indicator variable equal to 1 if the firm has acquired another audit firm by absorption, total split-off or global transfer of assets and liabilities; *BIG 4*: indicator variable equal to 1 if the audit firm is a member of the Big 4.

To determine whether a specific audit firm size is sensitive to our previous findings, in Table 5.9 and 5.10 we run the regression models again, using audit firms' size as a benchmark. For audit firms of group accounts, there is a negative relationship between size and profitability. Investment in staff resources has a positive and significant coefficient for the largest audit firms (Table 5.9, third and fourth columns).

Table 5.9. Profitability regression results by audit firms´ size threshold. Period 2003 – 2007.
Client segment: Consolidated financial statements

	QUARTILE 1[a] [≤ 4.609846]		QUARTILE 2[b] [>4.609846; ≤5.416168]		QUARTILE 3[b] [>5.416168;≤6.243875]		QUARTILE 4[b] [>6.243875]	
	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig
Intercept	-1.760		8.126		0.515		0.077	
LNSIZE	0.012		-0.077		-0.079		-0.040	**
CR4	0.298		2.453		0.088		0.600	
MKS	1.032		40.928		49.460		0.245	
LNAGE	0.023		0.004		0.017		0.008	
LNSUP	0.287		-1.022		-0.027		-0.074	
RSTAFF	0.074		0.089		0.181	**	0.244	**
SPEC	-0.007						-0.022	
MERGER	-0.615	*			0.031		-0.055	*
LIST	-0.072		-0.100	*	-0.043	**	-0.024	
R^2 (%)	5.41		1.91		6.11		10.95	
Wald test	9.46		24.14	**	19.33	*	23.63	**
N	244		245		245		244	

Notes: [a] Random effect GLS regression; [b] Random effect GLS regression estimated using robust standard error adjusted by clustering by firm. All p-values are two tailed. Test of significance of coefficients: *** < 0.001, **< 0.01, *< 0.05, + < 0.10
Variable definitions: *LNSIZE*: natural log of total assets; *CR4*: market share of the four largest firms; *MKS*: market share of a firm; *LNAGE*: natural log of number of years since the audit firm was established; *LNSUP*: natural log number of suppliers; *RSTAFF*: ratio of the audit firm's staff expenses to its operating expenses; *SPEC*: indicator variable equal to 1 if the audit firm´s market share is above 20%.; *MERGER*: indicator variable equal to 1 if the firm has acquired another audit firm by absorption, total split-off or global transfer of assets and liabilities; ; *LIST*: indicator variable equal to 1 if the audit firm supervises a listed group.

In Table 5.10, as well as in Table 5.9, we notice that there is not an exact correspondence between profitability and size quartiles. Furthermore, Investment in staff resources has a significant coefficient only for the third quartile in Table 5.10 (audit firms of individual accounts).

Table 5.10. Profitability regression results by audit firms´ size threshold. Period 2006 – 2010.
Client segment: Individual accounts

	QUARTILE 1[a] [≤4.073882]		QUARTILE 2[b] [>4.073882; ≤4.916785]		QUARTILE 3[a] [>4.916785;≤ 5.7687]		QUARTILE 4[c] [>5.76878]	
	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig
Intercept	-0.967		1.231	+	0.806		1.135	*
LNSIZE	0.146	+	-0.000		-0.004		-0.008	
CR4	0.751		0.532		0.431		-0.870	+
MKS	-199.940		38.560		20.050		-0.088	
LNAGE	-0.037		-0.028	*	-0.017		-0.002	
LNSUP	0.004		-0.232	***	-0.158	***	-0.035	
RSTAFF	-0.062		0.067		0.110	**	0.012	
SPEC							0.003	
MERGER			-0.057	***	0.259	+	-0.011	
BIG4							-0.036	
R^2 (%)	3.31		3.18		3.38		1.52	
F-statistic							11.15	***
Wald test	8.96		36.37	***	32.16	***		
N	906		904		905		905	

Notes: [a] Random effect GLS regression using robust standard error
[b] Random effect GLS regression estimated using robust standard error adjusted by clustering by firm
[c] Linear regression estimated using robust standard error adjusted by clustering by firm
All p-values are two tailed. Test of significance of coefficients: *** < 0.001, **< 0.01, *< 0.05, + < 0.10
Variable definitions: *ROA*: ratio of income from ordinary activities to total assets*; LNSIZE*: natural log of total assets; *CR4*: market share of the four largest firms; *MKS*: market share of a firm; *AGE*: number of years since the audit firm was established; *NSUP*: number of suppliers; *RSTAFF*: ratio of the audit firm's staff expenses to its operating expenses; *SPEC*: indicator variable equal to 1 if the audit firm´s market share is above 20%.; *MERGER*: indicator variable equal to 1 if the firm has acquired another audit firm by absorption, total split-off or global transfer of assets and liabilities; *BIG 4*: indicator variable equal to 1 if the audit firm is a member of the Big 4.

5.5.2.2. The prediction errors

Table 5.11 shows the ROA prediction errors for individual accounts over the period of analysis, estimated on the basis of the cross-sectional results of the OLS regression for 2008 (the benchmark year).

Table 5.11 exhibits negative and significant prediction errors in 2009 and 2010, i.e. the expected levels of profitability are below current levels. These unexpected or abnormal profitability ratios arise in the year following the implementation of the adapted IFRS for individual companies, that is 2009 (coefficient of -2.63), and continue into 2010 (coefficient of -3.56), after discounting the cumulative error associated with previous years. However, there is no relevant impact in 2008, the year the new accounting regulation came into force. Altogether, this evidence combined with the fact that 2008 is also considered the first year of the worldwide financial crisis, makes it difficult to attribute these results to the new accounting regulation.

Table 5.11. ROA prediction error for audit firms of individual accounts

Years	**2006**	**2007**	**2008**	**2009**		**2010**	
Panel A Mean Prediction Error: (Actual -Predicted ROA)/ Predicted ROA[a]							
ROA (%)	0	0.82	1.57	-2.63	*	-3.56	***
Panel B Mean Impact of Fee Prediction Errors in ratio [b]							
ROA		0.008	0.016	-0.027	*	-0.036	***

Test of significance: *** < 0.001, **< 0.01, *< 0.05, + < 0.10, respectively, two-tailed tests

[a] ROA percentage is calculated as $exp\big(ROA - E(ROA|IFRS = 0)\big) - 1$. The p-values are for differences from zero.

[b] Mean values of the impact of the prediction error, calculated as the prediction error after deducting the cumulative errors from 2006 through year t-1. The p-values are for differences from zero.

As commented previously, we replicate this analysis for audit firms of group of accounts in the robustness section.

5.5.3. ROBUSTNESS TESTS

Through additional tests, we aim to rule out the possibility that the previous results are driven exclusively by changes associated with the entry and exit of audit firms during our period of study. Also, we look at whether our results hold when market share is based on net sales.

First, we replicate our regressions after removing all audit firms without available observations for the entire five years of the study for each sample. Tables 5.12 and 5.13 display the results. We observe that the RMP hypothesis continues to prevail over the SCP paradigm in both segments, group and individual accounts. None of the largest audit firms, those with a market share above 20%, are included in the quartile of highest profitability for either segment, and size remains negative and significant. Staff investment continues to be an important driver of profitability for the segment of consolidated accounts. Furthermore, we perform our analyses again using net sales instead of client total assets as a measure of market share (Table 5.14 and 5.15), obtaining similar results.

Finally, Table 5.16 shows the *ROA* prediction errors for the audit firms of group accounts estimated on the basis of the cross-sectional results of the OLS regression taking 2003 as the reference year. Due to the lack of observations, we cannot estimate the model only for audit firms of listed groups. Therefore, we rerun the regressions over the whole sample, audit firms of listed and non-listed groups, to estimate the model in 2003. Table 5.16 reports no significant extra return prediction errors for any year. This lack of significance, even after deducting the cumulative error in Panel B of Table 5.16, together with the non-significant value for the dummy variable *LIST* in Table 5.7 (except for the first quartile, but even then, only at the 10% level), does not enable us to identify unexpected variations in profitability.

Table 5.12. Profitability regression results for overall sample and quartiles. Balanced panel. Period 2003 - 2007

	QUARTILE 1[a] [≤0.01665]		QUARTILE 2[b] [>0.01665; ≤.07615]		QUARTILE 3[b] [>.07615;≤ .1902]		QUARTILE 4[b] [>.1902]		TOTAL[b]	
	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig
Intercept	0.149		0.097	*	0.082		1.967	***	0.543	*
LNSIZE	0.033	**	0.003		-0.004	*	-0.074	***	-0.008	
CR4	-0.314		-0.084		0.072		-1.439	**	-0.545	*
MKS	-0.065		-0.065	*	-0.488		1.533	**	0.175	
LNAGE	-0.011		0.004		-0.001		0.015		0.028	
RSTAFF	-0.120	+	0.001		0.015		0.178	*	0.143	+
SPEC	-0.023		-0.005		0.131				-0.059	
MERGER	-0.107		-0.002		-0.016	**			-0.093	
LIST	-0.088		-0.006		0.003		-0.034		-0.018	
R^2 (%)	11.73		6.44		5.05		21.09		3.66	
F-statistic	1.26									
Wald test			79.06	***	22.89	**	30.35	***	98.78	***
N	187		188		187		188		750	

Notes: [a]OLS regression estimated using robust standard errors

[b] Random effect GLS regression estimated using robust standard error adjusted by clustering by firm

All p-values are two tailed. Test of significance of coefficients: *** < 0.001, **< 0.01, *< 0.05, + < 0.10

Variable definitions: *LNSIZE*: natural log of total assets; *CR4*: market share of the four largest firms; *MKS*: market share of a firm; *LNAGE*: natural log of number of years since the audit firm was established; *LNSUP*: natural log number of suppliers; *RSTAFF*: ratio of the audit firm's staff expenses to its operating expenses; *SPEC*: indicator variable equal to 1 if the audit firm´s market share is above 20%.; *MERGER*: indicator variable equal to 1 if the firm has acquired another audit firm by absorption, total split-off or global transfer of assets and liabilities; ; *LIST*: indicator variable equal to 1 if the audit firm supervises a listed group.

Table 5.13. Profitability regression results for overall sample and quartiles. Balanced panel. Period 2006 – 2010

	QUARTILE 1[a] [≤.01701]		QUARTILE 2[a] [> .01701; ≤ .06638]		QUARTILE 3[a] [>.06638;≤ .18188]		QUARTILE 4[a] [>.18188]		TOTAL[b]	
	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig
Intercept	-0.440		0.054		0.282	+	-1.707		1.597	**
LNSIZE	0.054	**	-0.000		-0.001		-0.081	*	0.013	
CR4	0.203		-0.009		-0.175		2.827		-1.719	*
MKS	-0.826	*	0.845		-0.520		87.599	+	-0.351	
LNAGE	-0.026		-0.002		-0.002		0.007		-0.014	
RSTAFF	-0.011		0.000		-0.001		-0.003		-0.004	
SPEC	0.080		-0.093		0.132				0.033	
MERGER	-0.007		-0.032		-0.013		-0.030		-0.005	
BIG4	-0.112	+	-0.125				-13.148	+	-0.106	
R^2 (%)	12.93		1.39		1.35		6.84		0.59	
F-statistic	4.84	***	.		.					
Wald test			.	.	.		.	.	136.17	***
N	529		529		529		528		2115	

Notes: [a]Linear regression estimated using robust standard errors adjusted by clustering by firm
[b] Random effect GLS regression estimated using robust standard error adjusted by clustering by firm
All p-values are two tailed. Test of significance of coefficients: *** < 0.001, **< 0.01, *< 0.05, + < 0.10
Variable definitions: *ROA*: ratio of income from ordinary activities to total assets*; SIZE*: total assets, measured in thousand €s; *CR4*: market share of the four largest firms; *MKS*: market share of a firm; *AGE*: number of years since the audit firm was established; *NSUP*: number of suppliers; *RSTAFF*: ratio of the audit firm's staff expenses to its operating expenses; *SPEC*: indicator variable equal to 1 if the audit firm´s market share is above 20%; *MERGER*: indicator variable equal to 1 if the firm has acquired another audit firm by absorption, total split-off or global transfer of assets and liabilities; *BIG 4*: indicator variable equal to 1 if the audit firm supervises a listed group.

Table 5.14. Profitability regression results for overall sample and quartiles. Period 2003 – 2007. Market share on the basis of net sales

	QUARTILE 1[a] [≤.01567]		QUARTILE 2[b] [>.01567; ≤.07565]		QUARTILE 3[b] [>.07565;≤0.20072]		QUARTILE 4[b] [>0.20072]		TOTAL[b]	
	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig
Intercept	0.097		0.210		0.055		3.709	**	0.931	
LNSIZE	0.026	*	0.001		-0.005	*	-0.058	***	-0.015	
CR4	-0.200		-0.041		0.051		-0.838	*	-0.174	
MKS	-0.448		-0.159	***	0.112		1.983	+	-0.151	
LNAGE	0.013		0.003		0.001		0.014		0.017	
LNSUP	-0.022		-0.028		0.011		-0.485	*	-0.131	
RSTAFF	-0.136	*	0.004		0.005		0.157	*	0.115	*
SPEC	0.056								0.018	
MERGER	0.013		-0.002		-0.017	**			-0.026	
LIST	-0.061		0.003		-0.005		-0.032		-0.011	
R^2 (%)	9.53		3.33		3.91		14.46		3.26	
F-statistic	2.13									
Wald test			32.85	***	28.30	***	30.12	***	180.07	***
N	244		243		243		243		973	

Notes: [a]OLS regression estimated using robust standard errors
[b] Random effect GLS regression estimated using robust standard error adjusted by clustering by firm
All p-values are two tailed. Test of significance of coefficients: *** < 0.001, **< 0.01, *< 0.05, + < 0.10
Variable definitions: *LNSIZE*: natural log of total assets; *CR4*: market share of the four largest firms; *MKS*: market share of a firm; *LNAGE*: natural log of number of years since the audit firm was established; *LNSUP*: natural log number of suppliers; *RSTAFF*: ratio of the audit firm's staff expenses to its operating expenses; *SPEC*: indicator variable equal to 1 if the audit firm´s market share is above 20%.; *MERGER*: indicator variable equal to 1 if the firm has acquired another audit firm by absorption, total split-off or global transfer of assets and liabilities; ; *LIST*: indicator variable equal to 1 if the audit firm supervises a listed group.

Table 5.15. Profitability regression results for overall sample and quartiles. Period 2006 – 2010. Market share on the basis of net sales

	QUARTILE 1[b] [≤.0133]		QUARTILE 2[a] [> .0133; ≤ .062665]		QUARTILE 3[b] [>.062665;≤ .17183]		QUARTILE 4[a] [>.17183]		TOTAL[b]	
	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig	Coefficient	Sig
Intercept	-0.047		0.064	*	0.109		-0.593		0.943	**
LNSIZE	0.092	***	-0.000		-0.001		-0.132	*	0.012	
CR4	-0.649		-0.067		-0.094		0.643		-0.471	
MKS	-3.191		0.338		-0.549		94.053	+	-0.045	
LNAGE	-0.049	*	-0.000		0.001		0.035		-0.032	**
LNSUP	0.017		0.002		0.010		0.160		-0.079	*
RSTAFF	-0.114	+	0.002		-0.004		0.056		0.040	
SPEC	0.408								-0.047	
MERGER	-0.001		-0.021	*	0.001		0.194		0.017	
BIG4	-0.040		-0.050		0.098		-11.041	+	-0.123	
R^2 (%)	9.71		0.61		0.86		7.59		0.64	
F-statistic										
Wald test	67.88	***	.	.	209.30	***	.	.	619.28	***
N	897		896		897		896		3586	

Notes: [a]Linear regression estimated using robust standard errors adjusted by clustering by firm
[b] Random effect GLS regression estimated using robust standard error adjusted by clustering by firm
All p-values are two tailed. Test of significance of coefficients: *** < 0.001, **< 0.01, *< 0.05, + < 0.10
Variable definitions: *ROA*: ratio of income from ordinary activities to total assets*; SIZE*: total assets, measured in thousand €s; *CR4*: market share of the four largest firms; *MKS*: market share of a firm; *AGE*: number of years since the audit firm was established; *NSUP*: number of suppliers; *RSTAFF*: ratio of the audit firm's staff expenses to its operating expenses; *SPEC*: indicator variable equal to 1 if the audit firm´s market share is above 20%.; *MERGER*: indicator variable equal to 1 if the firm has acquired another audit firm by absorption, total split-off or global transfer of assets and liabilities; *BIG 4*: indicator variable equal to 1 if the audit firm supervises a listed group.

Table 5.16. ROA prediction error for audit firms of group of accounts

Years	**2003**	**2004**	**2005**	**2006**	**2007**
Panel A Mean Prediction Error: (Actual -Predicted ROA)/ Predicted ROA[a]					
ROA (%)	0	-1.5	-0.5	-2.1	-1.2
Panel B Mean Impact of Fee Prediction Errors in ratio [b]					
ROA		-0.015	-0.005	-0.021	-0.012

Test of significance: *** < 0.001, **< 0.01, *< 0.05, + < 0.10, respectively, two-tailed tests
[a] ROA percentage is calculated as $exp\big(ROA - E(ROA|IFRS = 0)\big) - 1$. The p-values are for differences from zero.
[b] Mean values of the impact of the ROA prediction error, calculated as the prediction error after deducting the cumulative errors from 2003 through year t-1. The p-values are for differences from zero.

5.6. Conclusions

We have investigated the connection between market structure and audit firm profitability by testing two prevailing market power paradigms in industrial organization economics (SCP and RMP). Two ongoing research issues in the audit literature are the high market concentration in the hands of the Big4 and the entry barriers to auditing large clients faced by mid-sized and small audit firms. Researchers have normally addressed these issues with a model that uses different surrogates of audit costs to determine their impact on audit fees.

We aim to examine the influence of market structure and audit firms´ market power stemming from concentration (SCP) or market share (RMP) on the profitability of audit firms. We also isolate the unexpected variation in profitability associated with the implementation of IFRS on audit firms of consolidated and individual financial statements. For this purpose, we develop two panel models including measures of market structure, firm conduct and accounting reforms. We build two samples and collect data on 230 and 976 audit firms of group and individual accounts, respectively, from the Spanish audit market for the period 2003-2010.

Our results show evidence in favour of the relative market power hypothesis (RMP) for both segments, audit firms of consolidated and individual group accounts. This suggests that market share allows firms to exercise their market power and, therefore, is the key driver of audit firm profitability. Nevertheless, we highlight the fact that no firm with a market share of over 20% (our measurement of audit firm specialization) is ranked among the most profitable firms. Furthermore, size seems to have a negative effect within the top quartile of profitability. Therefore, these findings also raise questions about the continuous trend of merger activity in the market, whether it is motivated by scale efficiencies or, in fact, to increase entry barriers. In light of our analyses, we believe that our findings are in line with those of Ruiz-Barbadillo et al. (2016), who find high entry barriers among the largest audit firms in

the 2003-2010 period. Investment in staff resources plays a significant role in boosting the returns in the segment of large clients, but it is not significant in the individual accounts segment. Also, for audit firms of group accounts, profitability is negatively affected by the number of suppliers in the market. Finally, the implementation of IFRS does not exert an effect on audit profitability for either audit firms of consolidated financial statements of listed companies in 2005 or audit firms of individual financial statements in 2008.

Although we have performed several tests in our robustness section, we note that our results could be affected by endogeneity problems. Prior efforts to overcome endogeneity issues by using simultaneous equations and lagged variables (DeLorme et al., 2002) did not produce robust results. Nevertheless, although the unbalanced panel data prevented us from using lagged variables, we are aware that other methods might have yielded different results.

Despite these limitations, our study provides useful insight into the potential effects of market structure and how market power exerted through market share is more effective in profitability terms. Regulatory measures to stimulate the market may benefit from these findings.

Future research could also test efficient structure paradigms (Berger, 1995) to analyse whether scale or efficiency effects influence the relationship between market structure and audit profitability. Although our model incorporates surrogates of both effects, it is beyond the scope of this study to determine the direction of causality between these metrics and market structure. Finally, future studies could examine the problem of identifying the benchmark for optimal audit firm size which would maximize profitability while avoiding the inefficiencies associated with the largest firms.

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CAPÍTULO 6. CONCLUSIONES Y FUTURAS LÍNEAS DE INVESTIGACIÓN

Esta tesis se articuló en torno a un triple objetivo. El primero de ellos consistía en revisar la literatura previa sobre honorarios para determinar, basándonos en la evidencia empírica previa, cuales son los factores asociados con los precios de la auditoría. Una vez conocidas esas variables que deben formar parte de un modelo de honorarios, el segundo objetivo se centra en examinar la evolución de los mismos, tanto en el ámbito de los servicios de auditoría como el que corresponde por servicios adicionales de consultoría, e identificar el efecto, en caso afirmativo, derivado de la implementación de las Normas Internacionales de Información Financiera o NIIF (en inglés, International Financial Reporting Standards, IFRS). Nuestro tercer objetivo era abordar nuevamente el impacto de la aplicación de las NIIF sobre las firmas de auditoría pero a partir de un enfoque alternativo, es decir, a través del estudio de la relación entre la estructura del mercado de auditoría y la rentabilidad de las firmas de auditoras.

Para la consecución de estos objetivos generales se han desarrollado los capítulos previos que conforman el cuerpo principal de esta tesis, por lo que, a continuación vamos a trazar una breve síntesis de cada área de este trabajo, incidiendo en los objetivos planteados en cada una de ellas para, posteriormente, explicar brevemente los resultados alcanzados.

En primer lugar, tras destinar el primer capítulo a describir la motivación y objetivos generales, profundizamos en el segundo capítulo en el marco conceptual que sustentaría nuestro estudio empírico. De este marco teórico, identificamos las principales variables que conforman la función de remuneración del auditor y señalamos aquellas características que han suscitado un mayor interés por parte de los investigadores en los últimos años, y que, debido a su relevancia era conveniente realizar un análisis separado de las mismas. Por tanto, dedicamos el tercer capítulo a

recopilar, clasificar y cuantificar la mayor parte de los trabajos relacionados con el mercado de auditoría, centrándonos, específicamente, en aquellos que empleaban el modelo de honorarios de Simunic (1980) y nos planteamos los siguientes subobjetivos:

- Ampliar los metaanálisis llevados a cabo por Hay et al. (2006a) y Hay (2013), extendiendo el período temporal mediante la incorporación de artículos publicados entre 2007 y mediados de 2012, un período caracterizado por interesantes contribuciones al modelo de Simunic (1980).

- Proporcionar una representación más detallada y exhaustiva de aquellos factores que, en los últimos años, han sido una constante fuente de interés y preocupación entre los investigadores. Sería el caso de las debilidades del sistema del control interno y la implementación de mecanismos de gobierno corporativo en las firmas auditadas, pero también hemos analizado rasgos relativos a la calidad de la auditoría, en concreto, la especialización de auditor, y otros elementos asociados a su contratación, como la provisión conjunta de estos servicios junto con otros de consultoría.

- Identificar los potenciales moderadores que estarían influenciando los resultados de los diferentes estudios y que serían la causa de la heterogeneidad percibida cuando se trata de medir el tamaño del efecto de cada una de estas variables sobre los honorarios.

- Por último, evaluar la existencia de sesgo de publicación que sobreestimaría la influencia de las anteriores variables y, en caso de detectarlo, corregirlo mediante la aplicación de técnicas que nos permitieran estimar el verdadero tamaño del efecto (Stanley et al., 2008).

De nuestra revisión metaanalítica extraemos las siguientes conclusiones relevantes, que concretamos en los siguientes puntos:

- La calidad de la auditoría medida a través de la especialización industrial del auditor favorece la obtención de una prima adicional por este concepto. Por consiguiente, a mayor conocimiento y experiencia respecto a las características propias de un sector industrial, mayores serán los honorarios. No obstante, dada la heterogeneidad de los resultados publicados, nuestros análisis indican que la estrategia de diferenciación está moderada por el subrogado que se emplee como concepto de especialización (cuota de mercado, liderazgo exclusivo a nivel de ciudad o en el ámbito de ciudad y nacional), la aplicación de una regulación más estricta (período post-SOX) y por el poder de negociación de los clientes, puesto que únicamente está presente en el segmento inferior del mercado. Una vez eliminado el efecto del sesgo por publicación, la prima que reciben las firmas de auditoría por su especialización industrial es de alrededor del 3%.

- Nuestros resultados confirman la transferencia de conocimientos entre servicios adicionales y de auditoría (en inglés, knowledge spillovers), siendo la relación entre ambas variables positiva. No obstante, ésta pierde su significatividad cuando la metodología empleada (control de endogeneidad) se aplica en entornos caracterizados por una estricta regulación (EE.UU.). No hay evidencia de que los resultados se encuentren sobreestimados debido a una preferencia hacia la publicación de estudios con resultados significativos, siendo la prima por la provisión conjunta de ambos servicios del 10%.

- La detección de deficiencias en el sistema de control interno, intensifica el esfuerzo y la naturaleza de las pruebas realizadas durante el proceso de revisión de los estados financieros, lo que se traduce en un incremento en la facturación. Como variable moderadora destacaríamos, en el ámbito estadounidense, la presión alcista que ejerce sobre los honorarios la implementación de normativa más estricta respecto al sistema del control

interno (denominada en inglés, Auditing Standard No. 2 o AS2). Tras descartar que nuestros resultados metaanalíticos estén afectos por un sesgo de publicación, podemos concluir que, en términos generales, la prima asociada a esta variable es del 8%. En cualquier caso, estos resultados no los consideramos concluyentes, dado el escaso número de estudios publicados.

- Finalmente, examinamos la relevancia de otros mecanismos internos de control relativos al gobierno corporativo de las empresas. De estos análisis extraemos que, las actuaciones encaminadas a promover la independencia y diligencia de los Consejos de Administración favorecen la contratación de servicios de auditoría de mayor calidad, con el objeto de reducir su potencial responsabilidad legal, por lo que el incremento de costes derivado de la labor del auditor, tiene su contrapartida en unos mayores honorarios. Sin embargo, dada la reducida muestra utilizada, consideramos que estas conclusiones deben tomarse con cautela porque se necesitan más estudios empíricos que aborden este tema para obtener conclusiones robustas.

Finalizada nuestra revisión metaanalítica, los resultados alcanzados nos permiten abordar con mejor disposición el segundo objetivo central de esta tesis. Es, por tanto, que el capítulo cuarto está dedicado en exclusividad a analizar la evolución de los honorarios y el efecto en los precios de las firmas de auditoría derivados de la implementación de las Normas Internacionales de Información Financiera (NIIF).

El entorno en el que se ha desarrollado este trabajo es el español, donde la aplicación de la reforma contable se ha llevado a cabo en dos fases diferenciadas. La primera, en 2005 para los grupos consolidados cotizados (Reglamento 1606/2002 del Parlamento Europeo) y, la segunda, en 2008, a través del Nuevo Plan General de Contabilidad (NPGC) que supuso la adaptación de los estándares contables internacionales a empresas individuales. Es importante recordar que nuestra investigación se ha caracterizado por los siguientes elementos:

- Con excepción de entidades financieras y aseguradoras, nuestro estudio ha englobado a toda la población de compañías cotizadas de entre 2003 a 2009. Además, cabe resaltar que los grupos consolidados han estado afectos obligatoriamente en 2005 a la adopción de las NIIF y, posteriormente, en 2008, la adaptación posterior a empresas individuales (NPGC), se aplicó sobre las empresas matrices. Es decir, la fecha de cumplimiento de la normativa fue la misma para cada caso (2005 para los estados financieros consolidados y, 2008, para los estados financieros individuales, respectivamente).

- Los análisis se ejecutaron sobre grupos homogéneos de empresas que observaban los anteriores requisitos (consolidado frente individual y con igual fecha de obligada aplicación de la normativa) y sobre precios ajustados por la inflación.

- En la mayoría de los casos, la misma firma auditora supervisaba los estados financieros de la compañía matriz y de su grupo, estando además auditadas en un 90% por una de las *4 Grandes*.

- Por último, no solo examinamos variaciones relativas a honorarios por servicios de auditoría, sino también por servicios adicionales y por el montante total de servicios facturados.

Teniendo en cuenta los anteriores puntos, analizamos la evolución de los precios de las firmas auditoras y desarrollamos un modelo de honorarios, utilizado para estimar los servicios de auditoría, los adicionales y los honorarios totales, que utilizaba 2003 como año de referencia. Con el empleo de este modelo de "expectativas", estimamos para los siguientes ejercicios, los honorarios que se habrían satisfecho en caso de que la nueva normativa (NIIF o NPGC) no se hubiese aplicado y, por comparación con los correspondientes valores reales, calculamos la prima devengada.

Nuestras conclusiones más relevantes respecto al comportamiento de los honorarios durante el período 2003-2009 y la prima calculada, son las siguientes:

- Los honorarios de auditoría presentaron un considerable incremento desde 2003 a 2009 tanto para los grupos consolidados como para las empresas matrices (15% y 13% de tasa de crecimiento constante, respectivamente).

- Tras comparar los valores reales con los estimados, y remover el error de predicción acumulado, identificamos, en los honorarios por servicios de auditoría y para los grupos consolidados, incrementos significativos en 2004, siendo marginales en 2005 y 2006. Es razonable atribuir el origen de estos incrementos a la adopción de las NIIF, por lo que su efecto no se limitó a un único ejercicio sino que se percibió durante tres consecutivos. Además, nuevamente en el 2008, con la adopción del nuevo PGC, y a pesar de la experiencia previa, las empresas matrices volvieron a sufrir un incremento en precios.

- Los honorarios por servicios adicionales para los grupos consolidados presentan una tendencia alcista para el conjunto del período (11% de la tasa de crecimiento constante).

- La prima devengada por la implementación de la nueva normativa, respecto a los honorarios de servicios adicionales, no proporciona para los grupos consolidados cifras significativas hasta el ejercicio 2008. En el caso de las cuentas individuales, los resultados presentan una tendencia irregular a lo largo del período de estudio.

- Por último, para los honorarios totales, obtenemos incrementos significativos que afectarían a la supervisión de los estados financieros consolidados en 2005 y también en 2008. En lo tocante a los estados financieros de las

empresas individuales, esos incrementos serían significativos únicamente en 2008.

No obstante, de las anteriores conclusiones, no podemos deducir si los incrementos en precios observados en las fechas en las que comenzaron a aplicarse las NIIF, fueron como respuesta a unos mayores costes soportados o si, por el contrario, supusieron un aumento directo de la rentabilidad de las empresas auditoras. Por lo tanto, el planteamiento que reservamos para el quinto capítulo de esta tesis responde nuevamente al estudio del mercado de auditoría pero desde una óptica diferente, es decir, analizando la relación entre la estructura del mercado y la rentabilidad de las firmas auditoras a partir de la teoría desarrollada por el campo de la organización industrial.

Por tanto, bajo este marco teórico de la organización industrial, y más específicamente, los paradigmas estructura-conducta-resultado y poder de mercado (en inglés, structure-conduct-performance paradigm o SCP y relative-market-power o RMP, respectivamente), desarrollamos los siguientes objetivos:

- Examinar la estructura de mercado a través del poder de negociación de las firmas auditoras, diferenciando entre el alcanzado vía concentración o cuota de mercado de cada empresa, y determinar qué factor es considerado clave para explicar la conexión entre estructura-rentabilidad.

  Desde la óptica del paradigma estructura-conducta-resultado, a mayor concentración de las empresas en un mercado, mayores serán las barreras de acceso, lo que favorecerá tanto el tamaño como el poder de negociación de dichas empresas, lo que desencadenará en precios superiores a los que existirían en un mercado competitivo (Bain, 1951).

  Por el contrario, el paradigma poder de mercado establece que es la cuota de mercado de cada empresa y no la concentración del mercado, el

factor determinante en la rentabilidad de las empresas. En este sentido, las empresas obtendrían beneficios extras a partir del poder de mercado ejercido vía incrementos en su cuota de mercado (Shepherd, 1990a).

- Detectar variaciones en la rentabilidad de las firmas auditoras como consecuencia de la implantación de las NIIF.

Para alcanzar estos objetivos, diseñamos un modelo que incluye variables relativas a la estructura del mercado, conducta de las firmas auditoras y relativas a la reforma contable, y lo aplicamos sobre dos muestras con datos de panel no balanceados (230 firmas auditoras encargadas de supervisar grupos consolidados y 976 empresas auditoras de sociedades individuales). Mediante el empleo de técnicas de regresión habituales para datos de panel, pero también, y consecuente con la metodología aplicada y descrita en el capítulo cuarto, del cálculo de las variaciones no esperadas en la rentabilidad de las firmas de auditoría, obtenemos los siguientes resultados:

- El paradigma de poder de mercado (RMP) es el elemento clave en la conexión estructura – rentabilidad de las empresas para ambos segmentos estudiados (empresas de auditoría de grupos consolidados e individuales). Es decir, las mejoras en la rentabilidad de las firmas de auditoría proceden del poder de negociación de estas empresas a partir de su cuota de mercado.

- Aunque el paradigma de poder de mercado vincula la rentabilidad con la cuota de mercado y, esta última a su vez, con la diferenciación de producto, la variable que recoge el efecto de la especialización industrial en nuestro modelo no resulta significativa.

- En el segmento de los clientes grandes, la inversión en personal desempeña una función relevante a la hora de mejorar la rentabilidad de las empresas

auditoras, mientras que las barreras de entrada (log. natural del número de oferentes) repercuten negativamente sobre la misma.

- El tamaño de la firma auditora se encuentra negativamente asociado con la variable rentabilidad, lo que suscita dudas sobre cuál es el tamaño óptimo que permite mejoras en la rentabilidad a la vez que evita que se generen ineficiencias por el elevado tamaño de la firma.

- Por último, no encontramos evidencia que respalde que la implementación de las NIIF está asociada con una variación en la rentabilidad. Este resultado, en conjunto con el presentado en el anterior capítulo, podría explicase como que el incremento observado en precios por los servicios de auditoría durante el período de implementación de la nueva normativa sería un reflejo del incremento de costes derivado del mayor riesgo al que estarían expuestos los auditores por la aplicación de las NIIF y conforme con la Norma Internacional de Auditoría 200.

Entre las limitaciones de las investigaciones realizadas destacaríamos las siguientes:

- Respecto al metaanálisis realizado en el tercer capítulo, las relativas a las técnicas metaanalíticas de Hunter y Schmidt (1990) o las derivadas del bajo número de trabajos disponibles en determinadas áreas y que dificultaron la aplicación de técnicas de meta regresión. Además, la existencia de otros potenciales efectos moderadores no considerados en nuestros análisis pueden haber influido en nuestros resultados.

- En referencia al análisis de la política de precios llevado a cabo en el cuarto capítulo, y en concordancia con lo indicado por Diehl (2010), las derivadas de una clasificación errónea por parte de las empresas auditadas respecto a los honorarios por servicios de auditoría y adicionales o por las derivadas de

la influencia de cualquier otra variable o circunstancia relevante (otros cambios regulatorios) que no se encuentren recogidas en nuestro modelo.

- Respecto a nuestro análisis sobre la estructura del mercado de auditoría relativo al quinto capítulo de esta tesis, consideramos que los resultados pueden estar condicionados por problemas de endogeneidad, cuya corrección se ha visto dificultada por el empleo de una muestra no balanceada. Es importante matizar que, la aplicación de otra metodología podría influir en los resultados alcanzados.

Futuras investigaciones podrían extender el período temporal con respecto al análisis de las variables que conforman la función de remuneración del auditor. De esta forma, se podrían aplicar técnicas metaanalíticas sobre determinados efectos moderadores para los que no disponíamos de suficientes estudios publicados en el momento de la realización de esta investigación. Sería el caso, por ejemplo, de los honorarios por servicios de auditoría y adicionales en el período posterior a la adopción de SOX (2002). Por otro lado, también sería interesante evaluar otros potenciales moderadores que pueden tener un efecto en los resultados.

La ampliación del período temporal también puede considerarse no solo para evaluar la evolución en la relevancia de las anteriores variables, sino también para examinar la posterior variación de la política de precios de las firmas auditoras y, como otros cambios normativos posteriores al 2009, pueden estar influyendo en los precios.

Consideramos que sería relevante extender los análisis respecto a la relación entre estructura de mercado y rentabilidad, incorporando las hipótesis de eficiencia-estructura (Berger, 1995) y los potenciales efectos derivados de economías de escala o de eficiencia sobre los resultados. Por último, futuras líneas de investigación podrían examinar la cuestión del tamaño óptimo de la firma de auditoría.

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