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Auditor independence, joint determination of audit and non-audit fees and the incidence of qualified audit reports[*]

Independencia del auditor, determinación conjunta de los honorarios de auditoría y de servicios adicionales y la incidencia de los informes de auditoría con salvedades

ABSTRACT

The aim of this study is to examine whether the provision of non-audit services by the incumbent auditor compromises auditor independence in a low litigation risk environment such as in the case of Spain, where the audit litigation risk is not likely to be the main external deterrent for audit malpractices. To achieve this goal we analyse whether audit and non-audit fees are simultaneously determined, and we also test whether the joint provision of audit and non-audit services reduces the incidence of qualified audit reports. Confirming prior research, when running single equation models the results obtained are supportive of the presence of knowledge spillovers between the two services. Nevertheless, we also empirically establish that audit and non-audit fees are jointly determined and when applying a simultaneous-equation model, then, the flows of knowledge spillovers cannot be proved. We also find that auditors are not less likely to issue qualified audit reports when they jointly supply audit and non-audit services.

Key words: ethical behaviour, auditor independence, audit fees/non-audit fees, knowledge spillover, qualified audit reports.

RESUMEN

El objetivo de este trabajo es analizar si la independencia del auditor de una empresa se ve comprometida cuando presta de forma conjunta servicios de auditoría y servicios adicionales a la misma, en un entorno con bajo riesgo de litigio como es el español, donde no es probable que el auditor de cuentas se enfrente a algún litigio por haber llevado a cabo una mala praxis. Para alcanzar este objetivo, nosotros estudiamos si los honorarios de la auditoría y de los servicios adicionales a la misma se determinan de forma conjunta, así como también si la provisión conjunta de ambos servicios reduce la incidencia de informes de auditoría con salvedades. Al igual que la evidencia previa, nosotros concluimos que cuando aplicamos un sistema de ecuaciones simples se pone de manifiesto transferencia de conocimientos entre los dos servicios. No obstante, nosotros también contrastamos empíricamente que los servicios de auditoría y de los servicios adicionales a la misma se determinan conjuntamente y cuando aplicamos un modelo de ecuaciones simultáneas, los resultados no revelan transferencia de conocimientos. Por otra parte, también evidenciamos que los auditores que prestan de forma conjunta los dos servicios no son más proclives a reducir la emisión de informes de auditoría con salvedades.

Palabras clave: comportamiento ético, independencia del auditor, honorarios de auditoría y de servicios adicionales a la auditoría, transferencia de conocimiento, informes de auditoría con salvedades.

1. INTRODUCTION

The joint provision of audit and non-audit services by the same audit firm and the fact that it may jeopardize the independence of the auditor when issuing the audit report has repeatedly been a controversial issue.

The literature has traditionally contemplated two aspects of the audit independence: the mental attitude of the auditor characterized by the integrity and the objective approach to the audit process (named in fact independence). Some authors (Bazerman, 2007; Moizer, 1997; Sutton, 1997) point out that mental independence requires a freedom from personal interest, bias or susceptibility to excessive pressure. However, since this mental process is unobservable and auditors also have incentives to violate their independence through satisfying their clients so as to maintain the economic bonding to the client (Bazerman, Moore, Tetlock & Tanlu, 2006; DeAngelo, 1981), there is a need for the auditors to be perceived as independent (named independence in appearance) from the management team who prepares the financial statements. In this regard, the Securities and Exchange Commission (SEC) relies on the apparent independence when establishing that an auditor cannot be considered independent with respect to a particular client "if a reasonable investor, with knowledge of all relevant facts

and circumstances, would conclude that the auditor is not capable of exercising objective and impartial judgement" (SEC 2000, Section I).

The joint provision of audit and non-audit services has repeatedly been considered as the Damocle's sword hanging over the independence of the auditor because it can increase the economic bond between clients and auditors (Ashbaugh, 2004; Beattie, Goodacre & Fearnley, 2003; De Fuentes, 2005; Larcker and Richardson, 2004). The fee dependence may influence the auditor to agree, against his/her better judgment, with management's interpretations of accounting matters, which is an unethical behaviour that threatens auditor independence in fact. Therefore, after the well known financial scandals surrounding the beginning of this decade, and with the aim of restoring the apparent independence of the auditors and the reliability of financial information, regulators have placed particular attention on the provision of non-audit services by the incumbent auditor. In the United States, the Sarbanes Oxley Act (SOX) (2002) banned most non-audit services, meanwhile in Europe the new Eighth Directive focused on the economic dependence of the auditor when stating that:

> Member States shall ensure that adequate rules are in place which provide that fees for statutory audits are not influenced or determined by the provision of additional services to the audited entity (25th art. Directive 2006/43/CE).

However, highly reputed researchers have raised doubts about the adequacy of such normative restrictions, since the empirical evidence is far from providing homogeneous results and being supportive of impairment of independence fears. For instance, De Fond and Francis stated: "We believe that the SOX provision that bans most non-audit services is at best misguided and at worst politically-motivated" (2005, p. 6).

However, archival literature reveals that financial statements' users perceive that the joint provision of both services threatens auditor independence (Bartlett, 1993; Geiger, Lowe & Pany, 2002; Gul, 1991; Lowe and Pany, 1995; Lowe, Geiger & Pany, 1999; Knapp, 1985; Shockley, 1981). Additionally, some authors document that the join provision of both services can cause a reduction of qualified audit reports (Wines, 1994), more earnings management (Frankel, Johnson & Nelson, 2002) or more errors waived, among others, reducing audit quality as well (Hay, Knechel & Wong, 2006b). Thus, the regulators' worries about how objective an accounting firm can be in an audit, when it is also making millions of Euros providing the same client with other services, make sense.

Therefore, in our view, there is a need for further research that provides additional evidence supporting or rejecting the foundations of the auditor independence rules. The aim of this paper is to shed some light onto this topic by addressing two questions: the first one being a methodological issue, i.e. analysing if the use of simultaneous equations better estimate the amount of audit and non-audit fees and how the knowledge spillovers flow from one service to another. The second research question we address is whether the provision of non-audit services by the incumbent auditor reduces the incidence of qualified audit reports.

In our opinion, the Spanish setting represents a particularly useful context in which to analyse these research questions for several reasons. Firstly, following the international regulatory wave in response to the Enron debacle, the Spanish Audit Law (1988) was amended by

the Financial System Reform Act, 2002 (Law 44 / 22 November 2002). The new legislation hardened the joint provision of audit and non-audit services and required the full disclosure of related fees paid to the incumbent auditor by public companies, in order to supply information to investors that can therefore estimate if the magnitude of non-audit fees impairs their confidence in auditors' independence.

Secondly, the audit market structure is, as in most countries, highly dominated by the Big Auditing Firms. The Spanish audit market received a major boost from the mandatory audit requirement established by the Audit Act of 1988, but by the mid-1990s the market became increasingly mature and there was strong competition to win clients (García Benau, Garrido, Vico, Moizer & Humphrey, 1999)[1]. The mergers between Price Waterhouse and Coopers & Lybrand, and Arthur Andersen and Deloitte & Touche further increased the market share of the Big Four, making up to 98.66% of the total turnover of listed companies in 2003, while the merged firm of Deloitte España, S.L. accounted for 67% (De Fuentes, 2005).

Although the regulatory reassurance of the auditor independence and the high concentration of the audit market structure are almost worldwide characteristics of the audit service, the institutional, legal and corporate governance peculiarities of the Spanish setting are rather different from the circumstances of Anglo-Saxon countries to which most of the existing audit and non-audit fees literature refers to. Spanish companies are characterized by high ownership concentration, the major shareholders being industrial corporations and banks when referring to public entities, although the role of the financial institutions is not as prevalent as in other countries such as Japan and Germany. Besides, the legal environment is similar to most European and South American countries, classified as a French-origin civil law country, with weak investor rights, low investor protection and low litigation risk (La Porta, Lopez-de-Silanes, Shleifer & Vishny, 1998).

Summarising, although in Spain the legislative reform has paid particular attention to the influence of the amount of non-audit fees provided to the audit client, auditors face low external deterrents for independence malpractices since the audit litigation risk is low.

Our findings show that even in a country of low audit litigation risk, where auditors are hardly ever sued for misconduct and negligence, they are not less likely to give a qualified audit report when providing audit and non-audit services. Hence, our results are supportive of

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[1] The demand side of the audit service does show different growth rates in the number of audits: While the rate for mandatory audits is positive, basically due to the growth of companies, the demand for voluntary services is much more volatile, fluctuating between negative growth in 1994 and 1997 and expanding as high as 18% of growing rate in 1998. In more recent years, there was a steep fall in voluntary audit services impacting the total hours billed in 2003. This may have been a consequence of the loss of confidence in the reliability and credibility of the financial statements as a result of the Enron and Parmalat scandals in the United States and Italy, respectively.

On the supply side, the number of audit firms in Spain increased from 645 in 1991 to 1187 in 2005, but throughout that period the dominance of the Big Audit Firms has been outstanding. In this regard, empirical studies carried out in Spain (Carrera, Gutierrez & Carmona, 2005; García-Ayuso & Sánchez, 1999; García Benau, Ruiz Barbadillo & Vico Martínez, 1998) show that the market for audit services does not differ significantly from neighboring countries in structure and is highly concentrated.

the reputational theory, where the economic losses associated to the reputational damage and the loss of clients are external deterrents for an auditor misapplication of the audit standards.

The structure adopted in this paper is as follows. After this introduction, the second section provides a review of the prior research and the hypotheses development. In the third section, we present the methodology and sample used in our empirical study. The fourth section presents and analyses the results, and the fifth and final section describes our main conclusions.

2. LITERATURE REVIEW AND HYPOTHESES

Given that the aim of this paper is to examine whether the provision of non-audit services by the incumbent auditor compromises auditor independence, firstly we briefly analyse previous studies on audit and non-audit fees and their joint determination, and secondly we revise previous research on the effect that the joint provision of audit and non-audit services can have on the auditors' propensity to issue qualified audit reports.

2.1. Impairment of the auditor independence by the joint provision of audit and non-audit services

Since the seminal work by Simunic (1980) three research lines have emerged. The first consists of a group of studies that mainly estimate the model developed by Simunic (1980). These studies all deal with the likelihood that the Big Accounting Firms operate as a cartel and charge an audit premium to their clients (Cameran, 2005; Danos & Eichenseher, 1982; Eichenseher & Danos, 1981; Firth, 1985; Francis, 1984; Francis & Stokes, 1986; Low, Tan & Koh, 1990; Palmrose, 1986a; Simon, 1985).

The studies of the second research line concentrate on the existence of low-balling (Monterrey & Sanchez-Segura, 2007; O'Keefe, Simunic & Stein, 1994; Simon & Francis, 1988; Stein, Simunic & O'Keefe, 1994; Turpen, 1990; Walker & Castarella, 2000). In addition, these studies also aim to identify other, previously unanalysed determinants of audit fees (Bell, Landsman & Shackelford, 2001; Chan, Ezzamel & Gwilliam, 1993; Davis, Ricchiute & Trompeter, 1993; De Fuentes, 2005; Firth, 1997; Jubb, Houghton & Butterworth, 1996; Low *et al.,* 1990; O'Keefe *et al.*, 1994; Scott & Gist, 2005; Stein *et al.*, 1994; Turpen, 1990).

The studies of the third research line focus on the joint provision of audit and non-audit services. Furthermore, these studies also analyse the determinants of non-audit fees, or add non-audit fees as an explanatory variable for audit fees. An excellent meta-analysis of audit fees studies undertaken in various countries can be found in Hay *et al*. (2006b). Simunic (1984) models the joint demand for audit and non-audit services. His model suggests that the auditor would retain a portion of the cost savings from knowledge spillover when providing both services to the client. Results consistent with knowledge spillover are reported by Simunic (1984), Simon (1985), Palmrose (1986b), Turpen (1990), Barkess and Simnett (1994), Butterworth and Houghton (1995), Ezzamel, Gwilliam and Holland (1996), Jubb *et al*. (1996), Craswell and Francis, (1999), Bell *et al*. (2001), Seetharaman, Gul and Lynn (2002), Whisenant, Sankara-

guruswamy and Raghunandan (2003), Alam and Baez-Díaz (2005), De Fuentes (2005), Antle, Gordon, Narayanamoorthy and Zhou (2006), and Monterrey and Sanchez-Segura (2007). In general terms, these studies conclude that purchasers of non-audit services pay their auditors higher audit fees because of knowledge flowing from one service to the other. Felix, Gramling and Maletta (2001) find a negative and significant relationship between audit and non-audit fees. Conversely, Abdel-Khalik (1990), Davis *et al.* (1993), O'Keefe *et al.* (1994), Stein *et al.* (1994) and Sharma and Sidhu (2001) document no association between audit and non-audit fees; that is, they fail to find evidence of knowledge spillover.

A further step in this line of research is the analysis of the non-audit fee determinants (Abbot, Parker, Peters & Raghunandan, 2003; Antle *et al.*, 2006; Barkess & Simnett, 1994; Defond, Raghunandan & Subramanyam, 2002; Frankel *et al.*, 2002; ParKash & Venable, 1993; Raghunandan, Read & Whisenant, 2003; Sharma & Sidhu, 2001; Whisenant *et al.*, 2003).

Whisenant *et al.* (2003) use a simultaneous equation model and show empirically that audit fees and non-audit fees are simultaneously determined. They find a positive relationship between audit fees and non-audit fees when *OLS* is used, but they find no relationship when they use a simultaneous specification of the fee model applying two-stage least squares (2SLS). In the same vein, Hay, Knechel and Li (2006a) document that in New Zealand OLS regression results show a positive association between audit and non-audit fees, but they find no relationship between audit and non-audit fees using a simultaneous-equation model applying 2SLS, suggesting that audit and non-audit services are jointly determined.

Contrary to this evidence, Alam and Baez-Díaz (2005) find an association between audit and non-audit services using a simultaneous and single equation model and they reveal that audit and non-audit fees are simultaneously determined in the banking industry in the U.S. This evidence is supported by Antle *et al.* (2006). These results are consistent with economies of scope (knowledge spillover) running in both directions between audit and non-audit services.

Summarising, prior evidence about the association between audit and non-audit fees is mixed. Some authors conclude that non-audit services purchasers pay higher audit fees than non-purchasers (see, for instance, Ezzamel *et al.,* 1996, Seetharaman *et al*., 2002; Simunic, 1984). One explanation for this is that knowledge flows from audit to non-audit services. On the other hand, O'Keefe *et al.* (1994) claim that the relation between audit and non-audit fees should be negative. In this regard, Felix *et al*. (2001) find a negative and significant relationship between audit and non-audit fees. Hence, we make no prediction about the association between audit and non-audit fees when jointly purchased by the client and, therefore, the null hypotheses we seek to test are:

H1: Non-audit fees paid to the incumbent auditor are not associated with audit fees paid to the incumbent auditor.

H2: Audit fees paid to the incumbent auditor are not associated with non-audit fees paid to the incumbent auditor.

2.2. Impairment of auditor independence by the low incidence of qualified audit reports

On the other hand, Basioudis, Papakonstantinou and Geiger (2006) reveal that companies which pay higher audit fees are more likely to receive a going concern opinion, while companies with higher non-audit fees are less likely to receive this type of opinion. Similar evidence is reported by Wines (1994). Concretely, he reports that companies which pay higher non-audit fees to the auditing firms are less likely to receive qualified audit opinions.

On reflection, the previous research provides mixed evidence. However, considering that Spain is a context where auditors are less likely to be sued for misconduct and negligence (low litigation risk), we predict a negative relationship between the provision of non-audit services by the incumbent auditor and the auditors' propensity to qualify audit reports, and the hypothesis we seek to test is:

H3: The provision of non-audit services by the incumbent auditor is associated with the low incidence of qualified audit reports.

3. METHODOLOGY AND SAMPLE

3.1. Methodology

To test the first and second hypotheses we analyse whether audit and non-audit fees are simultaneously determined and whether economies of scope (knowledge spillover) run in both directions between audit and non-audit services.

As in previous research, the factors or determinants for audit and non-audit fees can be estimated (applying, for instance, the ordinary least squares [OLS] method) independently, using a single equation model for each estimation. Specifically, this procedure would consist of the following two fee models:

$$LNAF_i = \beta_0 + \beta_1 LNNAF_i + \beta' FACTORS_i + e_i \tag{1}$$

and

$$LNNAF_i = \lambda_0 + \lambda_1 LNAF_i + \lambda' FACTORS_i + \mu_i \tag{2}$$

where $LNAF_i$ and $LNNAF_i$ are the natural logs of audit and non-audit fees for firm$_i$, respectively; $FACTORS_i$ is a vector of determinants or factors that are supposed to influence audit and non-audit fees; and e_i and μ_i are the error terms.

In equation (1), $LNNAF_i$ and the error term e_i are likely to be correlated as the variable $LNAF_i$ and the error term μ_i in equation (2). Therefore, the OLS estimators are biased and inconsistent if the explanatory variables are distributed independently of the error term. This problem can be overcome through the use of simultaneous equations, so following prior authors (Alam & Baez-Díaz 2005, Antle *et al.*, 2006; Hay *et al.*, 2006a; Whisenant *et al.*, 2003), we run single-equation models in order to estimate audit and non-audit fees in equations (1) and (2),

respectively. Next we estimate equations (1) and (2) using a simultaneous equations approach (two-stage least square [2SLS]). The 2SLS model cleans the explanatory variables in (1) and (2) of the influence of their respective error term (*i.e.* e_i and μ_i).

As follows, we describe audit and non-audit fee models. To this end, we discuss variables that are likely to affect audit and non-audit fees.

3.1.1. *Audit fees*

In this section we discuss variables we expect to affect audit fees. We draw on Simunic (1980), Cameran (2005) and De Fuentes (2005) to identify factors that affect audit fees. Hence, the general model specification for the audit fee is as follows:

$$LNAF_i = \beta_0 + \beta_1 LNNAF + \beta_2 SIZE + \beta_3 BIG4 + \beta_4 AUDTEN + \beta_5 LOSS +$$
$$\beta_6 OPINQUAL + \beta_7 PROFIT + \beta_8 LEV + \beta_9 INVREC + \beta_{10} SUBS + \qquad (3)$$
$$\beta_{11} SUBSFOR + \beta_{12} EXT + \beta_{13} AC + \beta_{14} DATE + e_i$$

Where:

LNAF	=	Natural log of audit fees (in thousands of Euros)
LNNAF	=	Natural log of non-audit fees (in thousands of Euros)
SIZE	=	Natural log of total sales or turnover (in thousands of Euros)
BIG4	=	An indicator variable equal to 1 when the auditor is a Big Four firm, and 0 otherwise.
AUDTEN	=	Number of years the auditor has audited the financial statements of the company
LOSS	=	An indicator variable equal to 1 if the firms report negative net income in the current year or in the prior two years, and 0 otherwise.
OPINQUAL	=	An indicator variable equal to 1 if the company received a qualified opinion in either the current or previous year, and 0 otherwise.
PROFIT	=	Variable defined as net income less extraordinary items divided by total sales or turnover.
LEV	=	Leverage (Total Debt/Equity).
INVREC	=	Inventory plus accounts receivable divided by total assets.
SUBS	=	Square root of number of subsidiaries.
SUBSFOR	=	Number of foreign subsidiaries/Total number of subsidiaries.
EXT	=	Extraordinary items/Net income.
AC	=	An indicator variable equal to 1 if the company has an audit committee, and 0 otherwise.
DATE	=	An indicator variable equal to 1 if the fiscal year ends at 31st December, and 0 otherwise.

The most consistent result in all of the previous studies has been that company size is by far the most significant explanatory variable in determining audit fees. Then, the control variable measuring the natural log of total sales, SIZE, is intended to control for the size of the firm. It

is probable that audit work will increase with company size and, consequently, it is expected that bigger clients will pay higher audit fees than smaller clients (Whisenant *et al.,* 2003). Thus, the variable SIZE is hypothesised to have a positive relationship with audit fees.

Meanwhile, evidence shows that auditor size (Cameran, 2005; Palmrose, 1986a) is one of the variables that explains the level of audit fees. According to several authors (Chan *et al.,* 1993; Firth, 1985; Pong and Whittington, 1994), this is because the large accounting firms spend a lot of time and effort on testing and analysing information and data. In addition, according to DeAngelo (1981), big accounting firms can charge a premium as high quality auditors. Thus, a positive coefficient sign is expected on the BIG4 variable. Another variable introduced to control for auditor characteristics is auditor's tenure, AUDTEN. According to Antle *et al.* (2006), where auditors can charge higher audit fees in the first year of the audit engagement, a positive relationship can be expected between audit fees and auditor's tenure. Thus, we expect a positive association between audit tenure and audit fees.

To capture audit risk (see, for instance, Chan *et al.*, 1993; Firth, 1985), we include a variable reflecting whether the company reported negative net income in the current year or in the two prior years (LOSS). We expect a positive association between negative net income and audit fees. Another variable in the audit fee equation to control for audit risk is whether the firms received a qualified audit report (OPINQUAL). Given that a qualified audit report is a measure of risk, we predict a positive relationship between audit fees and a qualified opinion. A further audit risk variable is profit (PROFIT). Profitability can be another measure of firm risk, and therefore, we expect high profitability to lower risk for the auditor, because it is supposed that the company will be in good financial health. To control for agency costs, we include leverage (LEV). A positive relationship between leverage and audit fees is expected.

We also included variables in the audit fee equation to control for audit effort and complexity (see, for instance, Chan *et al.,* 1993; O'Keefe *et al.* 1994). A high ratio of inventory plus accounts receivable divided by total assets (INVREC) shows that the company has high levels of accounts receivable and inventory and, as a result, a greater audit effort will be required. For this reason, we predict a positive association between INVREC and audit fees. The complexity variables, which are expected to be positively associated with audit fees, are the square root of the number of subsidiaries (SUBS), the ratio of the number of foreign subsidiaries to the total number of subsidiaries (SUBSFOR), and the ratio of extraordinary items to net income (EXT). These three items may increase the complexity of the audit and, consequently, we expect audit fees to rise in their presence. An additional audit effort variable is whether the company has established an audit committee (AC)[2]. To the extent that an audit committee implies more work for auditors (monitoring and controlling managers and meeting with audit committee members) (see Vera-Muñoz, 2005), we expect a positive association between audit committees and audit fees.

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[2] Apart from De Fuentes (2005), we have not found any previous work that has used the existence of an audit committee as a determinant of audit fees. In Spain, Audit committees became well-known when the Olivencia Code of Good Governance was published in 1998 (Fernández, 1999), although a few Spanish listed companies already had it.

Audit work has a high seasonal component, so auditors could try to smooth their workload through pricing policy. Thus, emoluments for audit work performed during the period of the normal fiscal year end would be higher than audit fees charged to companies whose accounting period is different from the majority of firms. This factor has been tested through a dichotomy variable that references the normal/abnormal fiscal year end used, among others, by Chan *et al* (1993), Waresul and Moizer (1996) or Carson, Fargher, Simon and Taylor (2004). We expect a positive association between the dummy variable DATE and audit fees.

3.1.2. Non-audit fees

For factors affecting non-audit fees, we draw on Parkash and Venable (1993), Firth (1997) and Whisenant *et al*. (2003). The vector FACTORS (equation 2) refers to variations in the complexity of the auditee's operations, agency costs, the client's and auditor's size, audit risk, operating performance or profitability, audit tenure and audit quality. Hence, the general model specification for non-audit fees is as follow:

$$\begin{aligned}
LNNAF_i = &\lambda_0 + \lambda_1 LNAF + \lambda_2 SIZE + \lambda_3 BIG4 + \lambda_4 AUDTEN + \lambda_5 LOSS + \\
&\lambda_6 LIQUID + \lambda_7 OPINQUAL + \lambda_8 PROFIT + \lambda_9 LEV + \lambda_{10} INVREC + \\
&\lambda_{11} SUBS + \lambda_{12} SUBSFOR + \lambda_{13} EXT + \lambda_{14} AC + \lambda_{15} EQUITY + \mu_i
\end{aligned} \quad (4)$$

Where:

LIQUID   =   Ratio of current assets divided by current liabilities.

EQUITY   =   An indicator variable equal to 1 if the company issued new shares during the year or in the previous two years, and 0 otherwise.

The remaining variables are explained above in the audit fee model. Thus, the only differences between the audit and non-audit fee models are the variables DATE, EQUITY and LIQUID. The first was chosen as a determinant of audit fees because the literature on auditing pricing finds that DATE is positively associated with audit fees, whereas no empirical evidence exists to suggest that this variable is directly associated with non-audit fees. Consequently, we have not included DATE in the non-audit fee model.

On the other hand, we include EQUITY in the non-audit fee model because previous research (Firth, 1997; Raghunandan *et al*., 2003; Whisenant *et al*., 2003) shows that there is a positive association between new financing and non-audit fees. However, EQUITY has been excluded from the audit fee model because no empirical research exists to suggest that new financing directly determines audit fees. The issue of securities in the stock market, an activity which firms engage in occasionally, is not frequent; however, this activity has important implications for the company, and if it takes place, firms prefer to hire non-audit services to receive advice. In addition, it will be more effective and efficient if these non-audit services are hired from the incumbent auditor. For this reason, we also predict a positive relationship between the non-audit fees and EQUITY variable.

Furthermore, we include the Current or Liquidity ratio (LIQUID) as a measure of liquidity because companies with low liquidity levels may require a greater quantity of non-audit services or consultancy advice in order to resolve this problem (Firth, 2002). In this sense, employing the incumbent auditor as a consultancy adviser may increase efficiency and reduce costs. This means that the LIQUID variable has a negative relationship with non-audit fees.

BIG4 is included as a control variable. Previous research has shown that big auditing firms charge a premium fee, and this suggests that the type of accounting firm can influence non-audit fees. Nevertheless, the expected sign is not clear. Proxy for agency cost is LEV, expecting a negative sign. Meanwhile, the relationship (expected coefficient sign) between LOSS, PROFIT, OPINQUAL, INVERC, SUBS, SUBSFOR, EXT and AC and non-audit fees is the same as that holding between them and audit fees (i.e. it is positive or negative, as explained above).

3.1.3. *Qualified audit reports*

We test the third hypothesis examining the relationship between various combinations of four auditor fees variables and the audit opinion, estimating the following logistical regression model:

$$AR_i = \delta_0 + \delta_1 AUDITORFEE + \delta_2 SIZE + \delta_3 BIG4 + \delta_4 AUDTEN + \delta_5 LOSS + \delta_6 LEV +$$
$$+ \delta_7 PROFIT + \delta_8 LIQUID + \delta_9 SUBS + \delta_{10} INVREC + \delta_{11} LITGRISK + \delta_{12} AOPRIOR + \eta_i \qquad (5)$$

Where:

AR = This variable takes the value 1 if the firm has received a qualified audit report and 0 if it has received a clean opinion.

AUDITORFEE = In order to test the hypothesis regarding qualified audit reports, we added to the model four different fee variables in various combinations. Thus, AUDITORFEE is either NAF/TF (ratio of non-audit fees to total fees paid to the incumbent auditor), LNAF (natural log of audit fees), LNNAF (natural log of non-audit fees) or LNTF (natural log of total fees).

LITGRISK = An indicator variable equal to 1 if the firm operates in a high-risk industry, as identified by Francis, Philbrick and Schipper (1994).

AOPRIOR = An indicator variable equal to 1 if the company received the same qualification in the previous and the current year; and 0 otherwise.

The remaining variables are explained above in previous models. As indicated above, the auditor fees variables NAF/TF, LNAF, LNNAF and LNTF are added to the model in various combinations. Whether the joint provision of audit and non-audit services compromises auditor independence, we expect a negative coefficient on NAF/TF, LNTF and on its separate components, LNAF and LNNAF.

Since the prior literature has shown that the propensity to issue a qualified audit report may be influenced by other factors, we have included several control variables that are likely

to affect this propensity (see Pucheta-Martínez & De Fuentes, 2007). Thus, we use company size, *S*IZE, as a proxy for auditor independence, although we do not expect any sign since the literature provides contradictory results (Carcello, Hermanson & Huss, 1995; McKeown, Mutchler & Hopwood, 1991; Mutchler, Hopwood & McKeown, 1997). For the variable auditor type, BIG4, we expect a positive sign since the likelihood of receiving a qualified audit report is higher for companies audited by Big brand-name auditors than for firms audited by second-tier firms (DeAngelo, 1981; Becker, DeFond, Jiambalvo & Subramanyam, 1998; Teoh & Wong, 1993). On the other hand, we expect a negative association between the probability of receiving a qualified audit report and the auditor tenure variable, AUDTEN, since the longer the auditor's tenure (and the more dependent the auditor is on the client), the more likely the auditor will be to yield to client pressures (Richard & Vanstraelen, 1999).

Given that financial health has been identified as a factor that may increase the likelihood of the auditor's issuing a qualified audit report (Carcello *et al*., 1995; Chen & Church, 1992; Mutchler *et al*., 1997), four variables have been included to control for the financial distress effect. These are leverage, LEV, as a proxy for the agency cost of debt (see Archambeault & DeZoort, 2001; Willekens, Bauwhede & Gaeremynch, 2004) and reported negative net income in the current year or in the prior two years; LOSS, since high leverage and losses may increase the likelihood of receiving qualified audit reports (Ruiz Barbadillo, Gómez Aguilar & Carrera Pena, 2006; Sánchez Segura, 1999). Moreover, we have also added PROFIT and LIQUID, expecting a negative sign for both variables because a company with high profitability and liquidity is supposed to be in good financial health and therefore, it is less likely to receive a qualified audit report.

To capture the complexity of business operations that can lead to more errors and irregularities and a greater likelihood of qualification of the accounts by the auditor, we consider the square root of number of subsidiaries, SUBS.

Two additional variables are used to capture higher liquidity risk areas for auditor responsibility and for which greater caution and exercise of independent auditor judgement is called (Monroe & Teh, 1993). These are the ratio inventory plus accounts receivable divided by total assets, INVERC, larger values of which are more likely to be associated with an increased propensity to qualify as well as firms that operate in a high-risk industry, as identified by Francis *et al*. (1994), LITGRISK.

Another factor requiring control is whether the qualification is initial or recurrent, as this could affect the likelihood of receiving a qualified audit report in the next year. An initial qualification is received when the audit report for the previous year was unqualified or contained a qualification of a different category from that issued in the current year. When the same qualification is expressed for two or more years running, it is defined as recurrent. In this regard, it is likely that a firm that received a qualified audit report due, for instance, to an uncertainty with unquantifiable potential effects on the financial statements, will receive a similar audit report the next year if the circumstances have not changed. Thus, we expect a positive association between the variable AOPRIOR and the receipt of a qualified audit report.

3.2. Sample

As mentioned above, the public disclosure of audit and non-audit fees became compulsory for public companies after the approval of the Spanish Financial System Reform Act in 2002.

The sample for this study consists of all firms required to file their financial statements, audit report and management report to the "Comision Nacional del Mercado de Valores" (CNMV) (the supervisory body of the Spanish stock exchanges). Consequently, it includes all companies listed on one or more of the Spanish Securities Exchanges or issuing bonds or debentures. The CNMV keeps an Official Register, freely accessible to the public, where the financial data can be consulted.

The sample comprises 135 companies, excluding financial services firms[3] and companies that did not provide data for the whole set of variables, during the year 2002. Of the 135 studied, 94 were listed on the *Mercado Continuo Español* (MCE-Spanish Interconnected Market), a computerized network connecting the country's four exchanges (Madrid, Barcelona, Valencia and Bilbao), during the period analysed. All the major and most liquid securities are traded electronically on this market. Audit and non-audit data for all the firms were obtained from their financial statements. A summary of the sample used is provided in Table 1.

Table 1
Description of the sample.

Initial sample of firms	148
Less: firms not providing data concerning one or more of the model variables, banking and financial industry companies and companies whose turnover was 0 during the year 2002	13
Total firms forming the final sample	135

In Table 2 we show the distribution of the sample by industry. Table 3 reports descriptive statistics for the variables in the audit fees and non-audit fees models. Analysing the mean of audit and non-audit fees, we observe that Spanish clients tend to purchase the same amount of audit and non-audit services. In addition, comparing the mean values of audit fees, non-audit fees and total sales, we may observe that almost €1 of audit and non-audit fees are paid to the incumbent auditor for every €5.069 in total sales. This suggests that audit and non-audit fees represent approximately 0.02% of total sales for the sample.

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[3] Financial services companies have been excluded from the sample because, given their activity, this sector presents certain particularities which make it different from the non-financial sectors. For instance, these firms usually provide a high ratio of leverage, which can bias the results.

Table 2
Sample distribution by industry.

Industry description	Number	Percentage
Basic metals	8	5.92
Cement, glass and construction materials	5	3.72
Construction	7	5.17
Energy and water (water, gas, electricity, mining and petrol)	14	10.39
Mass media	6	4.41
New technology	8	5.92
Property	26	19.25
Retailing and other services	12	8.88
Metal manufacturing	8	5.92
Transportation and communication	9	6.67
Other manufacturing industries (food, drinks, tobacco, textiles and printing)	28	20.75
Other	4	2.97
Total	135	100

Table 3
Descriptive statistics for variables.

Panel A: Continuous variables				
Variable	Mean	Standard	Minimum	Maximum
			Deviation	
AUDITFEES (e thousands)	72.04	109.225	1	800
NONAUDITFEES (e thousands)	73.11	249.57	0	2.253
TOTALFEES (e thousands)	145.16	320.00	1	2.632
SIZE (e thousands)	365.011	1.060.377	84	9.348.387
AUDTEN	4.55	1.90	1	6
LIQUID	2.88	6.25	0.05	52.05
PROFIT	0.86	2.47	-0.82	16.46
LEV	0.47	.22	0.01	1.07
INVEREC	.26	.23	0	0.84
SUBS	3.34	2.44	0	12.88
SUBSFOR	.22	.26	0	1
EXT	-.24	1.37	-7.19	4.03
Panel B: Dichotomous variables				
Variable	N	Proportion of dummy = 1 (%)		
BIG4	135	79%		
DT	135	38%		
PWC	135	19%		

Table 3 *(Continued)*
Descriptive statistics for variables.

Variable	N	Proportion of dummy = 1 (%)
EY	135	10%
KPMG	135	13%
OAF*	135	21%
LOSS	135	14%
OPINQUAL	135	15%
AC	135	22%
DATE	135	96%
EQUITY	135	21%
LITGRISK	135	32%

AUDITFEES = Audit fees (in thousands of euros)

NONAUDITFEES = Non-Audit fees (in thousands of euros)

TOTAL FEES = The sum of audit and non-audit fees.

SIZE = Total sales or turnover (in thousands of euros)

AUDTEN =Number of years the auditor has audited the financial statements of the company

LIQUID = Ratio of current assets divided by current liabilities.

PROFIT = Variable defined as net income less extraordinary items divided by total sales or turnover

LEV =Leverage (Total Debt/Equity)

INVREC = Inventory plus accounts receivable divided by total assets

SUBS = Square root of number of subsidiaries

SUBSFOR = Number of foreign subsidiaries/Total number of subsidiaries

EXT = Extraordinary items/Net income

BIG4 = An indicator variable equal to 1 when the auditor is a Big Four firm, and 0 otherwise.

DT = Deloitte & Touche

PWC = PriceWaterhouseCoopers

EY = Ernst & Young

KPMG

OAF =Other audit firms or Second tier firms

LOSS = An indicator variable equal to 1 if the firms reports negative net income in the current year or in the two years prior, and 0 otherwise.

OPINQUAL = An indicator variable equal to 1 if the company received a qualified opinion in either the current or previous year, and 0 otherwise.

AC = An indicator variable equal to 1 if the company has an audit committee, and 0 otherwise.

DATE = An indicator variable equal to 1 if the fiscal year ends at 31st December, and 0 otherwise.

EQUITY = An indicator variable equal to 1 if the company issued new shares during the year or in the two years prior, and 0 otherwise.

LITGRISK = An indicator variable equal to 1 if the firm operates in a high-risk industry, as identified by Francis *et al.* (1994)

4. EMPIRICAL ANALYSES

4.1. Audit and non-audit fees paid to accounting firms by industry

Table 4 shows audit and non-audit fees paid to accounting firms by industry. As we can observed, companies in retailing and other services, basic metals, transportation and communication and metals manufacturing sectors pay more than 85% of total fees for audit services. Companies in cement, glass and construction materials or in construction sectors pay almost 73% and 60%, respectively, of their total fees for audit services. On the other hand, property and other manufacturing industries (Food, drinks, tobacco, textiles and printing) pay approximately 50% of total fees for audit and the remaining 50% for non-audit services. Finally, audit firms receive more than 60% of their total fees from non-audit services provided to the energy and water, mass media and new technology sectors. We can observe that there is a great disparity in the volume of additional services provided to different industrial sectors: Meanwhile non-audit services emoluments of retailing companies only account for up to 2% of the total fees, new technology companies pay a bill of additional services that represents 68% of the total amount.

4.2. Hausman test for endogeneity

Before estimating equations (3) and (4) simultaneously, we identify whether there is simultaneity, that is, if the regressors in equations (3) and (4) are endogenous and, therefore, likely to be correlated with their respective error terms. Then, as explained above, we need to use an alternative procedure such as the two stage least squares (2SLS)[4] method (Gujarati, 1995).

We use the Hausman test for this purpose, which includes the residuals of each endogenous right-hand side variable, as a function of all exogenous variables, in a regression of the original model. This involves running each of the equations (3) and (4) in two-steps. In the first step, an estimate of the endogenous variables is obtained by regressing on exogenous variables. The coefficients are estimated in the second step using the residuals from the first stage as an added variable. If the coefficient of the residuals is different from zero, then the simultaneity has caused a bias.

In our statistical analysis, both coefficients are different from zero and statistically significant so the evidence supports the presence of endogeneity in both directions. Thus, we estimate a system of two simultaneous equations in order to jointly determine audit and non-audit fees.

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[4] Two-stage least-squares regression uses instrumental variables that are uncorrelated with the error terms to compute estimated values of the problematic predictor(s) (the first stage), and then uses those computed values to estimate a linear regression model of the dependent variable (the second stage). Since the computed values are based on variables that are uncorrelated with the errors, the results of the two-stage model are optimal.

Table 4

Audit fees and Non-Audit fees paid to Accounting firms by industry.

Industry description	Number	Audit Fees Mean (in thousands of euros) (%)	Non-Audit Fees Mean (in thousands of euros) (%)	Total Fees Mean (in thousands of euros)
Basic metals	8	54.25 (96.88)	1.75 (3.13)	56 (100)
Cement, glass and construction materials	5	70.20 (72.37)	26.80 (27.63)	97 (100)
Construction	7	88.86 (60.04)	59.14 (39.96)	148 (100)
Energy and water (water, gas, electricity, mining and petrol)	14	183.98 (35.67)	331.78 (64.33)	515.76 (100)
Mass media	6	68.83 (38.17)	111.50 (61.83)	180.33 (100)
New technology	8	107.25 (31.78)	230.25 (68.22)	337.50 (100)
Property	26	28.83 (55.70)	22.93 (44.30)	51.76 (100)
Retailing and other services	12	106.33 (98.08)	2.08 (1.92)	108.41 (100)
Metal manufacturing	8	63.37 (85.06)	11.13 (14.94)	74.50 (100)
Transportation and communication	9	22.00 (92.94)	1.67 (7.06)	23.67 (100)
Other manufacturing industries (food, drinks, tobacco, textiles and printing)	28	59.71 (54.10)	50.64 (45.90)	110.35 (100)
Other	4	17.50 (87.50)	2.5 (12.50)	20 (100)

4.3. Audit fees

In Table 5 we present the results of estimating the audit fees equation using a single equation model (OLS estimate) and a simultaneous-equation model. Using the single-equation specification, the F-statistic is significant at 1% and adjusted R^2 is 81%. The intercept is significant at 5% and shows a negative relationship with audit fees. Consistent with prior evidence, we find a significant and positive coefficient for the non-audit fee variable (LNNAF). This suggests that non-audit services purchasers pay higher audit fees than non-purchasers.

On the other hand, SIZE, BIG4, PROFIT and SUBS are statistically significant at 1%, showing a positive association with audit fees. This suggests that big companies audited by

a big auditing firm with high levels of profit and subsidiaries pay more audit fees than small firms audited by a second-tier firm with low levels of profit and no subsidiaries. The remaining variables are not statistically significant.

All the significant variables offer the expected sign, except the coefficient on profit, which shows a positive direction, opposite to the predicted sign but similar to prior findings (Carson *et al*., 2004; Waresul Karim & Moizer, 1996).

Next, we examine whether the findings obtained from single-equation estimation of audit fees leads to incorrect inferences because of simultaneous-equation bias. Table 5 also offers the 2SLS estimates based on equations (3) and (4). We find that the LNNAF variable is not statistically significant and therefore does not directly influence audit fees after controlling for the joint determination of the fees. The audit fee model explains 56.22% of the variation in audit fees. We find that only the SUBS variable is positive and statistically significant so, consistent with Whisenant *et al.* (2003), the complexity of operations influences the determination of audit fees.

Table 5
Result for the determinants that affect AUDIT FEES (N=135 companies).

Variables	OLS estimate (Single-Equation Specification)			2SLS estimate (Simultaneous-Equation Specification)	
	Expected sign	Parameters estimated	t statistic	Parameters estimated	t statistic
Intercept	+/-	-1.200	-3.230**	7.387	0.846
Independent variables					
LNNAF	+/-	0.054	2.127**	1.942	1.011
Control variables					
SIZE	+	0.339	10.098***	-0.631	-0.643
BIG 4	+	0.567	4.358***	-0.793	-0.567
AUDTEN	+	0.018	0.733	-0.041	-0.538
LOSS	+	0.113	0.814	-0.971	-0.868
OPINQUAL	+	0.077	0.556	0.750	1.026
PROFIT	-	0.120	5.241***	-0.204	-0.621
LEV	+	-0.201	-0.795	-1.028	-1.029
INVREC	+	0.072	0.305	3.774	0.994
SUBS	+	0.107	4.431***	0.177	2.250**
SUBSFOR	+	0.060	0.300	-0.776	-0.860
EXT	+	0.023	0.654	0.727	1.011
AC	+	0.084	0.686	-0.365	-0.698
DATE	+	0.094	0.413	0.160	0.389
Statistics Adjusted or pseudo R^2	81.03%			56.22%	
F-statistic (probability value)	42.713 (0.000***)			12.20 (0.000***)	

***Significant at the level of 1%.
**Significant at the level of 5%.
*Significant at the level of 10%

Table 5 (*continued*)
Result for the determinants that affect AUDIT FEES (N=135 companies).

LNNAF = Natural log of non-audit fees (in thousands of euros).

SIZE = Total sales or turnover (in thousands of euros).

BIG4 = An indicator variable equal to 1 when the auditor is a Big Four firm, and 0 otherwise.

AUDTEN =Number of years the auditor has audited the financial statements of the company.

LOSS = An indicator variable equal to 1 if the firms reports negative net income in the current year or in the two years prior, and 0 otherwise.

OPINQUAL = An indicator variable equal to 1 if the company received a qualified opinion in either the current or previous year, and 0 otherwise.

PROFIT = Variable defined as net income less extraordinary items divided by total sales or turnover.

LEV =Leverage (Total Debt/Equity).

INVREC = Inventory plus accounts receivable divided by total assets.

SUBS = Square root of number of subsidiaries.

SUBSFOR = Number of foreign subsidiaries/Total number of subsidiaries.

EXT = Extraordinary items/Net income.

AC = An indicator variable equal to 1 if the company has an audit committee, and 0 otherwise.

DATE = An indicator variable equal to 1 if the fiscal year ends at 31st December, and 0 otherwise.

4.4. Non-audit fees

In Table 6 we report the results for the determinants of non-audit fees using a single equation model (OLS estimate). We find that the model is significant at 1% and adjusted R^2 is 35.30 %. LNAF is positive and significant at 1%. The intercept is significant at 1% and shows a negative relationship with non-audit fees. On the other hand, the SIZE, INVREC, SUBS, EXT and EQUITY variables are also statistically significant at 1% or 5%, with SIZE and EQUITY showing a positive association with non-audit fees, while INVREC, SUBS and EXT display a negative association. This suggests that big companies which issued new shares during the year or in the two years prior will pay higher non-audit fees than smaller firms, whereas companies with a high ratio of INVREC (Inventory plus accounts receivable divided by total assets), a high ratio of EXT (extraordinary items/net income) and with subsidiaries will pay lower non-audit fees. We find that the remaining variables are not statistically significant and do not influence non-audit fees.

We also report in Table 6 the results for the simultaneous-equation specification of the non-audit pricing model. The LNAF variable is not statistically significant. This suggests that audit fees are not a determinant of non-audit fees after controlling for simultaneous bias. Thus, it seems that simultaneous bias is the reason for the reported association between audit and non-audit fees in the non-audit fees model. Additionally, we find that the model is statistically significant and adjusted or pseudo R^2 is 34.50%. Only the INVREC, EXT and EQUITY variables are statistically significant. While INVREC and EXT exhibit a negative association with non-audit fees, EQUITY shows a positive relationship.

Table 6

Result for the determinants that affect Non-AUDIT FEES (N=135 companies).

Variables	Expected sign	OLS estimate (Single-Equation Specification)		2SLS estimate (Simultaneous-Equation Specification)	
		Parameters estimated	t statistic	Parameters estimated	t statistic
Intercept	+/-	-4.338	-3.903***	-2.353	-0.625
LNAF	+/-	0.599	1.912*	1.931	0.706
Control variables					
SIZE	+	0.346	2.213**	-0.173	-0.176
BIG 4	+/-	0.193	0.397	-0.686	-0.396
AUDTEN	+	0.020	0.233	0.003	0.029
LOSS	+	0.559	1.183	0.316	0.541
LIQUID	-	0.014	0.451	0.008	0.282
OPINQUAL	+	-0.361	-0.755	-0.450	-0.889
PROFIT	-	0.122	1.387	-0.064	-0.182
LEV	-	0.610	0.679	1.020	1.038
INVREC	+	-1.753	-2.227**	-1.684	-2.079**
SUBS	+	-0.177	-1.996**	-0.288	-0.900
SUBSFOR	+	0.553	0.810	0.343	0.479
EXT	+	-0.357	-2.906***	-0.369	-2.968***
AC	+	0.190	0.444	0.148	0.279
EQUITY	+	0.888	2.216**	1.083	2.663***
Statistics					
Adjusted or pseudo R^2		35.30%		34.50%	
F-statistic		5.866		5.670	
(probability value)		(0.000***)		(0.000***)	

***Significant at the level of 1%.

**Significant at the level of 5%.

*Significant at the level of 10%

LNAF = Natural log of audit fees (in thousands of euros).

SIZE = Total sales or turnover (in thousands of euros).

BIG4 = An indicator variable equal to 1 when the auditor is a Big Four firm, and 0 otherwise.

AUDTEN =Number of years the auditor has audited the financial statements of the company.

LOSS = An indicator variable equal to 1 if the firms reports negative net income in the current year or in the two years prior, and 0 otherwise.

LIQUID = Ratio of current assets divided by current liabilities.

OPINQUAL = An indicator variable equal to 1 if the company received a qualified opinion in either the current or previous year, and 0 otherwise.

PROFIT = Variable defined as net income less extraordinary items divided by total sales or turnover.

LEV = Leverage (Total Debt/Equity).

INVREC = Inventory plus accounts receivable divided by total assets.

SUBS = Square root of number of subsidiaries.

SUBSFOR = Number of foreign subsidiaries/Total number of subsidiaries.

EXT = Extraordinary items/Net income.

AC = An indicator variable equal to 1 if the company has an audit committee, and 0 otherwise.

EQUITY = An indicator variable equal to 1 if the company issued new shares during the year or in the two years prior, and 0 otherwise.

4.5. Qualified audit reports

In Table 7 we report the results of estimating the logistic regression in equation (5), introducing various combinations of the fee variables in Model 1, 2, 3 and 4, with Model 2 testing whether total fees reduce the propensity to issue qualified audit reports and Model 4 simultaneously analysing the effect of non-audit and total fees on the low incidence of qualified audit reports.

Table 7
Result for the factors that affect Qualified audit reports (N=135 companies).

Variables	Expected sign	Model 1 Parameters estimated (p-value)	Model 2 Parameters estimated (p-value)	Model 3 Parameters estimated (p-value)	Model 4 Parameters estimated (p-value)
Intercept	+/-	-3.096 (0.280)	-3.104 (0.283)	-2.977 (0.309)	-2.827 (0.343)
NAF/TF	-	-1.408 (0.352)		-1.686 (0.420)	
LNTF	-		-0.280 (0.595)	0.144 (0.847)	
LNAF	-				0.410 (0.599)
LNNAF	-				-0.122 (0.534)
Control variables					
SIZE	+/-	-0.302 (0.274)	-0.230 (0.483)	-0.347 (0.337)	-0.420 (0.253)
BIG 4	+	1.415 (0.249)	1.371 (0.275)	1.362 (0.281)	1.148 (0.366)
AUDTEN	-	0.134 (0.539)	0.162 (0.470)	0.124 (0.581)	0.112 (0.621)
LOSS	+	1.560* (0.082)	1.493* (0.094)	1.542* (0.087)	1.451 (0.101)
LEV	+	1.289 (0.584)	1.053 (0.646)	1.278 (0.587)	1.036 (0.652)
PROFIT	-	-1.382* (0.091)	-1.344* (0.098)	-1.409* (0.086)	-1.448* (0.071)
LIQUID	-	0.006 (0.958)	-0.005 (0.964)	0.008 (0.945)	0.006 (0.960)
SUBS	+	-0.302 (0.448)	0.183 (0.345)	0.129 (0.538)	0.112 (0.597)
INVERC	+	2.677 (0.138)	2.802 (0.116)	2.691 (0.139)	2.845 (0.123)
LITRISK	+	0.141 (0.851)	0.132 (0.863)	0.155 (0.838)	0.175 (0.816)

Table 7 (*Continued*)
Result for the factors that affect Qualified audit reports (N=135 companies).

Variables	Expected sign	Parameters estimated (p-value)	Parameters estimated (p-value)	Parameters estimated (p-value)	Parameters estimated (p-value)
APRIOR	+	4.351*** (0.000)	4.365*** (0.000)	4.329*** (0.000)	4.260*** (0.000)
Statistics					
Adjusted or pseudo R^2		60.10%	59.60%	60,10%	59.80%
%Classification		92%	92.6%	92,6%	92.60%
χ^2		56,368	55,732	56.405	56.012
(Sig. .000)		(0.000***)	(0.000***)	(0.000***)	(0.000***)

***Significant at the level of 1%.

**Significant at the level of 5%.

*Significant at the level of 10%.

NAF/TF = Ratio of non-audit fees to total fees paid to the incumbent auditor

LNTF = Natural log of total fees (audit plus non-audit fees) (in thousands of euros)

LNAF = Natural log of audit fees (in thousands of euros)

LNNAF = Natural log of non-audit fees (in thousands of euros)

SIZE = Total sales or turnover (in thousands of euros)

BIG4 = An indicator variable equal to 1 when the auditor is a Big Four firm, and 0 otherwise.

AUDTEN =Number of years the auditor has audited the financial statements of the company

LOSS = An indicator variable equal to 1 if the firms reports negative net income in the current year or in the two years prior, and 0 otherwise.

LEV = Leverage (Total Debt/Equity)

PROFIT = Variable defined as net income less extraordinary items divided by total sales or turnover

LIQUID = Ratio of current assets divided by current liabilities.

SUBS = Square root of number of subsidiaries

INVREC = Inventory plus accounts receivable divided by total assets

LITGRISK = An indicator variable equal to 1 if the firm operates in a high-risk industry, as identified by Francis *et al.* (1994)

AOPRIOR = An indicator variable equal to 1 if the company received the same qualification in the previous and the current year; and 0 otherwise.

Four models introduce the following combinations of the fee variable: NAF/TF alone, LNTF alone, both NAF/TF and LNTF, and both LNAF and LNNAF, respectively. The findings in the four models show that the estimated coefficients are statistically insignificant in every case. The hypothesis that the provision of non-audit services reduces the propensity to issue qualified audit reports cannot be supported since in Models 1 and 3 the variable NAF/TF is insignificant and in Model 4 the insignificant variable is LNNAF. The analysis of Models 2 and 4 also show that total fees do not cause a low incidence of qualified audit reports since there is a lack of significance on LNTF in Models 2 and 3 and on both LNAF and LNNAF

in Model 4. The lack of significance on the fee variables in Model 4, which simultaneously deals with the impact of non-audit fees and total fees, reveals that auditor fees do not threaten auditor independence.

The fit of the four models ranges from 59.60% to 60.10%, while the level of correct classification (i.e. the percentage of correct predictions) ranges from 92% to 92.60%. The χ^2 test confirms that the four models are significant.

In order to test for the presence of multi-colinearity, we have calculated the Spearman correlation coefficients for all the independent and control variables. The results, which are not reported in order not to enlarge the paper, show that none of the correlations between pairs is so high (> .85) as to present significant multi-colinearity problems (see Archambeault & DeZoort, 2001). Further analyses such as the VIF test, the condition index and variance proportions were also carried out without giving rise to significant problems[5].

5. SENSITIVITY TESTS

In this section we analyse the robustness of the results regarding the joint determination of audit and non-audit fees. To this end, we split the sample into sub-samples, based on various characteristics that could cause differential knowledge spillovers that are not obvious in the full sample.

5.1. Partitioning the sample by auditor size

After splitting the sample into Big4 firms and Non-Big4 firms, we estimate both the single-equation and the simultaneous-equation models of the audit and non-audit fees models. We aim to analyse whether the audit and non-audit fees models are independent for sub-samples with Big4 and Non-Big4 auditors. If we focus on the sub-sample of Big4 auditing firms, we find that non-audit fees are determinants of audit fees using OLS (coefficient = .053; sig. .047) but not using 2SLS (coefficient = -1.327; sig. .383), and that audit fees are not determinants of non-audit fees using OLS (coefficient = .656; sig. .102) and 2SLS (coefficient = -4.024; sig. .396). Once again the results are affected by simultaneous-equation bias. For the Non-Big4 sub-sample, we find that non-audit fees are not determinants of audit fees (coefficient = -.012; sig. .933) and audit fees are not determinants of non-audit fees (coefficient = .172; sig. .607) using *OLS*.

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[5] We also examined the variance inflation factors (VIF's), and none was so high as to indicate multi-colinearity problems (see Neter et al, 1985), since all values are below 10, which is generally used as a critical threshold according to Haan (2002). We also considered the condition index and variance proportions, and no evidence of serious multi-colinearity arose in the regressions. Hair, Aderson, Tatham and Black (1995) point out that the threshold value for the condition index is usually in the range of 15 to 30. A multi-colinearity problem is indicated where a condition index accounts for more than 0.90 of the variance of two or more coefficients (not the constant). We did not find any dimension that had values at this level. We also examined the standard errors of the parameter estimates as identified in the logistic regression model for all the hypothesized variables. These were smaller than the parameter estimates. Consequently, we may conclude that multi-colinearity does not pose a significant problem for these regressions.

Furthermore, the results are not affected by simultaneous-equation bias because, after estimating both models using 2SLS, the coefficients are not statistically significant. Our finding is not robust for the sub-sample with Big4 accounting firms, estimating a single-equation non-audit fees model in which audit fees is an explanatory variable (without splitting the sample), or Non-Big4 accounting firms, estimating a single-equation audit (non-audit) fees model in which non-audit (audit) fees is an explanatory variable (without splitting the sample)**.** These results suggest that fee model specification is sensitive to auditor size. Specifically, sensitivity is likely to be more important in samples with Non-Big4 auditing firms.

5.2. Partitioning the sample by client size

In order to analyse whether our sample is sensitive to client size, we partition the sample using the median value of total sales into large (total sales above median) and small companies (total sales below median). We estimate audit and non-audit pricing models using OSL and 2SLS for the samples with large and small companies. For the large companies sample, we document that non-audit fees are significant and positive in the audit fees model employing the OLS estimation, but not statistically significant using 2SLS. We also find that audit fees are significant in the non-audit fee model using the OLS estimation, but not using 2SLS. This suggests that simultaneous-equation bias is the cause of the association between non-audit fees and audit fees in the auditing pricing model and between audit fees and non-audit fees in the non-auditing pricing model. For the small companies sub-sample the results are not consistent with those obtained for the large companies sub-sample. Using OLS and 2SLS estimation, none of the coefficients is statistically significant. Thus, we may conclude that simultaneous-equation bias does not cause different inferences in the small companies sub-sample. In line with prior research (Craswell*,* Francis & Taylor, 1995), in this study fee model specification is also sensitive to client size.

6. CONCLUSIONS

This research investigates the threat to auditor independence (unethical behaviour) caused by the provision of non-audit services by the incumbent auditor. Two settings are used to address this topic. The first studies whether audit and non-audit fees are simultaneously determined. The second studies whether the joint provision of audit and non-audit services affects auditors' propensity to issue qualified audit reports.

Consistent with prior research (Alam & Baez-Díaz, 2005; Antle *et al*., 2006; Hay *et al*., 2006a; Monterrey & Sanchez-Segura, 2007; Whisenant *et al.,* 2003;), we show that audit and non-audit fees are positively associated in both audit and non-audit fees models by estimating a single-equation audit (non-audit) fees model in which non-audit (audit) fees is an explanatory variable. This suggests that knowledge spillovers occur from one service to the other.

However, the Hausman test shows that audit and non-audit fees are simultaneously determined. We then explicitly consider the simultaneous determination of audit and non-audit fees. The results are not consistent with non-audit fees directly influencing audit fees or audit fees directly influencing non-audit fees. In conclusion, we find no association between audit and non-audit fees using a simultaneous specification of the fees system. These results are not consistent with knowledge spillovers from the joint performance of audit and non-audit services after controlling for the joint behaviour of audit and non-audit fees. Hence, knowledge spillovers from non-audit to audit services, as well as from audit to non-audit services, differ depending whether single or simultaneous equation specifications are used, suggesting that single-equation specifications of either audit or non-audit fees suffer from simultaneous-equation bias or a statistical misspecification.

On the other hand, the findings also reveal that the joint provision of audit and non-audit services as well as total fees do not reduce the incidence of qualified audit reports. We have reached this evidence after using various combinations of fee variables.

Our findings suggest that although in Spain auditors do not face a high litigation risk, they seem to show an independent behaviour even when providing audit and non-audit services. These results can also be considered as supportive of the reputational theory, since auditors' reputation concerns and the fears of losing the clients may also influence their behaviour.

The results of the study are subject to possible limitations. Firstly, the study only examines the impairment of Spanish auditor independence during one year, and the results may therefore not be transportable over different time periods and locations. In addition, some particular Spanish characteristics such as the low litigation risk for auditors or the high level of ownership in listed companies, among others, can explain why these results cannot be extended to other settings. This limitation also provides additional opportunities for investigating this topic in different countries; in particular, there is a need to have deeper insight into different legal and institutional environments. Secondly, our results reveal that knowledge spillovers from non-audit to audit services, as well as from audit to non-audit services, appear differently using single and simultaneous equation specifications. In addition, we also evidence that auditors are not less likely to issue qualified audit reports when they jointly supply audit and non-audit services. However, these results document association, not causation.

Despite these limitations, from a policy perspective, and taking into account the hot debate over the supply of certain types of non-audit services to the audit clients, the data suggest that the fears of some legislators about the impairment of auditor independence whether both services are jointly provided (see, for instance, Sarbanes-Oxley Act 2002; Eight EC Directive or LAC, 1988) may not be justified. Thus, it would be interesting to observe if regulators proceed with caution before placing further limitations on auditors' services.

From a research perspective, the findings of this study should motivate further inquiry into whether the joint provision of audit and non-audit services may provide benefits to the company, given that the criticisms against the joint supply of both services are less supported.

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