Audit Partner Industry Specialization and Audit Quality: Evidence from Spain

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Abstract:

We investigate the impact of the industry specialization of individual auditors on audit quality. We aim to contribute to a quickly growing line of research examining the importance of audit partners as determinants of audit quality. To provide robust results, we use several proxies of both industry specialization and audit quality. We conduct the empirical analysis with a sample of Spanish listed companies for the 2005-2013 research period. Our main result is the lack of a significant impact of partner's industry specialization on audit quality. This result seems rather sound as it holds across all measures of industry specialization used in the empirical study and it does not depend on the proxy of audit quality. Our main result, which contradicts most of the scarce available evidence, stresses the importance of the institutional context in the study of the partner's industry specialization-audit quality relationship and advocates the need for further research.

Keywords: lead audit partner; industry specialization; auditor expertise; audit quality; discretionary accruals; audit services; auditor reputation; learning process; specialized versus non-specialized knowledge; characteristics of the lead partner.

1. INTRODUCTION

DeAngelo (1981) defined audit quality as the joint probability that an auditor will both detect and report a material misstatement. Accordingly, the provision of high-quality audit services requires the auditor to be both competent (in order to be able to identify accounting misstatements) and independent (in order to report the detected misstatements). Lead audit partners, as the ultimate responsible for the audit report, are expected to play a fundamental role in determining the quality of audit services. According to Gul, Wu & Yang (2013), individual auditors differ in terms of their incentives and attributes such as risk preference, expertise, ability or cognitive style. Therefore, individual auditors should also differ with respect to the competence and independence dimensions of audit quality. It is precisely because of the importance of individual auditors' idiosyncrasies that audit firms try to maintain consistency in the quality of audit services through control mechanisms (Jeppesen, 2007; Gul, Wu & Yang, 2013). A quickly growing number of empirical studies have addressed the role of individual auditors as determinants of audit quality (e.g. Carey & Simnett, 2006; Gul, Wu & Yang, 2013; Aobdia, Lin & Petacchi, 2015; Knechel, Vanstraelen & Zerni, 2015; Garcia-Blandon & Argiles, 2017). While the issue of industry specialization has received a lot of attention at the audit firm level (level (e.g. Craswell, Francis & Taylor, 1995; DeFond, Francis & Wong, 2000; Balsam, Krishnan, & Yang, 2003; Casterella et al., 2004; Dunn & Mayhew, 2004; Carson, 2009), only few papers have investigated how industry specialization of the lead audit partner impacts audit quality (Chin & Ci, 2009; Chi & Chin, 2011; Zerni, 2012; Chin, Yao & Liu, 2014; Goodwin & Wu, 2014). These studies generally agree in that industry specialization contributes to enhance audit quality. Due to the data availability, this evidence is limited to just four countries: Taiwan (Chin & Chi, 2009; Chi & Chin, 2011; Chin, Yao & Liu, 2014; Chi et al., 2017), Sweden (Zerni, 2012), Australia (Goodwin & Wu, 2014) and China (Chen, Sun & Wu, 2010). While these papers differ in many significant ways (i.e. the country investigated, the measurement of industry specialization or the proxy of audit quality), they generally agree that industry specialization contributes to enhance audit quality.

Some authors have encouraged to further investigate audit quality at the partner level in those markets where data are available (DeFond & Francis, 2005). Chen, Sun & Wu's (2010) findings on the importance of legal and regulatory changes to better understand the relationship between auditors and clients stress the need to conduct empirical studies across different institutional settings. This view is more explicit in Bedard (2012) who advocated for replication studies in any jurisdiction currently requiring engagement partner signature. He argued that because of the importance of the institutional context (i.e. quality control policies

of audit firms, regulatory inspections and interaction with client personnel in charge of governance) on the level of accountability for lead engagement partners and, given that this institutional context is largely country specific, replication studies conducted in previously uninvestigated audit markets should be welcomed.[1]

Our study aims to contribute to the scarce literature on audit quality at the partner level by analyzing the impact of industry specialization on audit quality in the Spanish audit market. To this aim, we proxy audit quality by discretionary accruals and auditor' opinion. We perform the empirical analysis using a sample of Spanish listed companies for the period 2005-2013. While our paper shares important similarities with Chin & Chi (2011), the main difference apart from the country investigated is that, unlike the single indicator of industry specialization used by these authors, we provide a more comprehensive analysis of industry specialization and use several measures of specialization. According to Audousset-Coulier, Jeny & Jiang (2016), the measurement of industry specialization is of utmost importance for the empirical analysis. Since the level of industry specialization is not observable, researchers have to provide indirect proxies for this concept. A main result in Audousset-Coulier, Jeny & Jiang (2016) is that the use of different industry specialization proxies results in inconsistent classifications of auditors as specialists. Although they investigate the industry specialization of the audit firm, their results can be easily extended to the partner level. Therefore, in order to provide sounder results it seems necessary to use the widest possible set of industry specialization measures.

In anticipation of our results, unlike prior related research we do not find any significant impact of partner's industry specialization on audit quality. This result seems quite robust as it does not depend on the measure of industry specialization or on the proxy of audit quality. This unexpected result might have some interesting implications for the audit literature and encourage further research on the issue, particularly in audit markets which have not been investigated so far.

The remaining of the paper is structured as follows. The next section discusses the available evidence on the effects of individual auditor characteristics on audit quality. The third section presents the design of the empirical research and the selection of the sample. In section four, we report and discuss the results of the research while in the last section conclusions are drawn.

2. REVIEW OF THE LITERATURE AND RESEARCH QUESTION

2.1. Industry specialization and audit quality

Following Audousset-Coulier, Jeny & Jiang (2016), the many studies on the effects of industry specialization on audit quality reveal a lack of consensus on the best measure of industry specialization. This is basically explained by the very complexity of the industry specialization concept, which the different proposed measures fail to adequately capture. Industry specialist auditors are generally defined according to industry market shares, and market shares are computed using different metrics such as audit fees, total assets and sales revenues. Empirical studies on auditor industry specialization, most of them conducted at the audit firm level, differ with regard the metric of industry specialization. According to Audousset-Coulier, Jeny & Jiang (2016), while most papers use the market share of the auditor in the industry (e.g. Ferguson, Francis, & Stokes, 2003; Kwon, Lim, & Tan, 2007; Chin & Chi, 2011; Zerni, 2012), some others authors follow a portfolio share approach and focus on the relative distribution of audit services provided to the various industries served by each audit firm (e.g. Numan & and Willekens, 2012). A second important difference is that, no matter if the study follows a market or portfolio share approach, researchers use a variety of measures (i.e. audit fees, client size, or number of clients) to compute auditor industry shares. Finally, a third difference is the specific criteria used to define industry specialist auditors: the auditor/s with the largest market share/s in the industry (e.g. Chin & Chi, 2011), auditors with an industry market share above a given threshold (e.g. Casterella et al., 2004) or auditors with the largest number of clients in the industry (e.g. Chin & Chi, 2009).

Empirical papers also differ regarding the proxy of audit quality, as they use discretionary accruals (e.g. Balsam, Krishnan, & Yang, 2003; Gul, Fung & Jaggi, 2009; Lim & Tan 2010), the opinion of the audit report (e.g. Reichelt & Wang, 2010), earning response coefficients (e.g. Kwon, Lim, & Tan, 2007; Lim & Tan, 2008), the reporting of financial fraud (Carcello & Nagy, 2004) or audit fees (e.g. DeFond, Francis & Wong, 2000; Ferguson, Francis & Stokes, 2003; Zerni, 2012; Goodwin & Wu, 2014). It is worthwhile noting that the same problems associated with the measurement of industry specialization also hold with audit quality, as the several proxies proposed present one limitation or another. Even though these papers tend to agree that industry specialization is associated with higher levels of audit quality, some authors (e.g. Ferguson, Francis & Stokes, 2003; Francis, Reichelt & Wang, 2005; Basioudis & Francis, 2007) argue that industry expertise is more based on office-level industry leadership than on national-level leadership.

Audousset-Coulier, Jeny & Jiang (2016) focused on the validity of industry specialization metrics used in archival audit research and concluded that these metrics exhibit a low degree of internal and external construct validity. As the authors pointed out, the diversity of proxies used to measure auditor market and portfolio shares, the various criteria adopted to classify auditors as industry specialists and, we would also add, the lack of consensus on the best proxy of audit quality (Francis, 2004), do not only make it difficult to compare and interpret the reported results, but it also raises questions on the reliability and validity of these results.

2.2. Evidence at the audit partner level

Focusing on the industry specialization of lead audit partners, a preliminary issue to examine is the very role of audit partners. In countries such as Spain, where the signature of the lead audit partner is required, these partners are explicitly accountable for the audit report. According to Bedard (2012), the interest of scholars in the use of engagement partner data to investigate audit quality is a natural step in a progression which has included various levels of specificity, from global audit firm networks to local offices. The next step in this progression is to examine how the characteristics of lead audit partners might affect audit quality. Knechel (2000) pointed out that audit quality is ultimately dependent on an auditor's judgment and decision-making qualities, as auditing is inherently a judgment and decision-making process. In the same vein, more recent evidence provides support for a relevant role of lead audit partners (e.g. Gul, Wu & Yang, 2013; Knechel, Vanstraelen & Zerni, 2015), as it shows the importance of some personal characteristics of the leader (i.e. audit style, educational background and prior experience in large international audit firms) for the quality of audit services.

The psychological literature (e.g. Chi, Glaser & Rees, 1982; Glaser & Chi, 1988) has stressed the importance of domain-specific knowledge as a determinant of expertise. Focusing on the audit sector, Craswell, Francis & Taylor (1995) pointed out that in order to ensure the quality of audit services, auditors need some specific knowledge to complement generic accounting and audit knowledge. Bonner & Lewis (1990) investigated the relative importance of different types of knowledge and abilities to explain the performance of individual auditors. The authors concluded that general audit experience (a measure of generic knowledge) plays a relatively minor role when compared with task-specific training and experience and innate ability. In the same line, Ashton (1991) found that industry experience (a proxy of specific knowledge) is positively correlated with the quality of audit services. However, as posed by Bedard (2012),

while most prior studies have shown that industry-specialist auditors working in their industry outperform other auditors, some exceptions also exist (e.g. Bedard & Biggs, 1991; Solomon, Shields & Whittington, 1999).

Some prior studies have empirically examined the impact of the industry specialization of individual auditors on various proxies of audit quality: accounting restatements (Chin & Chi, 2009), discretionary accruals (Chi & Chin, 2011; Chi et al., 2017), the likelihood of a modified audit opinion in the audit report (Chi & Chin, 2011; Chen, Sun & Wu, 2010), audit fees (Zerni, 2012; Goodwin & Wu, 2014), the ownership structure of syndicated loans (Chin, Yao & Liu, 2014) and interest spreads on loans (Chi et al., 2017). Most of these articles agree that the industry specialization of the partner contributes to the building up of expertise and, thus, to higher-quality audit services. However, Hsieh & Lin (2015) provided an interesting alternative explanation, as they found that partner-level industry specialists are less likely to accept clients with higher audit risk.

Most studies on partner's industry specialization have investigated the Taiwanese audit market. Chin & Chi (2009) reported a negative effect of industry specialization on the likelihood of accounting restatements and thus a positive effect on audit quality. Similarly, subsequent results by Chi & Chin (2011) showed positive association between industry specialization and audit quality as measured by both discretionary accruals and the issuance of modified audit opinions. However, in the analysis with discretionary accruals significance was reported only at marginal levels. More recently, Chi et al. (2017) also reported marginally significant effects of industry specialization on discretionary accruals and non-significant effects on interest rate spreads. Still for Taiwan, Chin, Yao & Liu (2014) found that lenders value partner industry audit experts when structuring the ownership of the syndicated loans, and concluded that lenders tend to infer audit quality from the characteristics of the signing audit partners. As Chi et al. (2017), the main goal of Chen, Sun & Wu (2010) was not the study of industry specialization, however, they reported a non-significant impact of industry specialization on audit quality, as proxied by the opinion of the audit report, in the Chinese audit market.

With a sample of Swedish companies, Zerni (2012) studied the effects of partner's industry specialization on audit quality as proxied by audit fees. He concluded that industry specialization is viewed by the users of financial statements as differentiation strategies involving different levels of audit quality and thus resulting in higher audit fees. It should be

noted, however, that Bedard (2012) warned about the serious shortcomings of audit fees to adequately measure audit quality.

Finally, the evidence reported by Goodwin & Wu (2014) for the Australian audit market shows that partner's industry specialization is highly significant and economically important. Similar to Zerni (2012), they use audit fees as the proxy of audit quality. Interestingly, the authors also found that auditor industry expertise fee premium is much more a partner-level than an office-level phenomenon.

The research question of this paper is: Does the industry specialization of the lead audit partner affect audit quality? Despite the important role played by individual auditors as determinants of audit quality, only a few papers have investigated how the industry specialization of the lead audit partner impacts audit quality. According to Bedard (2012), the current professional audit environment needs to be taken into account when investigating how individual auditors influence audit quality as it affects the level of accountability for lead engagement partners. With this regard, some features of the Spanish audit market need to be taken into account when examining the relationship between industry specialization and audit quality. First, the Spanish audit market is regarded as a low litigation risk market (Ruiz-Barbadillo et al. 2004), and thus, lead audit partners do not face strong incentives to produce high quality audits. This feature might justify a softer relationship between industry specialization of lead partners and audit quality in Spain if compared with high litigation risk countries. Second, during our research period, the rotation of lead audit partners was mandatory in Spain after a maximum of seven consecutive years with the client. Finally, the Spanish audit market for listed companies presents an extremely high level of concentration by Big-4 firms (over 90 percent).

3. RESEARCH DESIGN AND SAMPLE SELECTION

This study investigates the impact of the industry specialization of lead audit partners on audit quality. We use two proxies of audit quality: discretionary accruals and the opinion of the audit report, and conduct the empirical analysis with a sample of public Spanish companies for the research period: 2005-2013. Next, we detail the design of the empirical analysis and the selection of the sample.

3.1. Research design

3.1.1. Discretionary accruals

As it is usual in the accounting and auditing literature, we proxy the quality of audit services by discretionary accruals (e.g. Myers, Myers & Omer, 2003; Carey & Simnet, 2006; Gul, Fung & Jaggi, 2009). Thus, we implicitly assume that high-quality audits should lead to higher earnings quality by reducing the management of earnings through discretionary accruals. Discretionary accruals are computed as the residuals from Jones' (1991) model, as modified by Dechow, Sloan & Sweeney (1995):

$$TA_t/A_{t-1} = \alpha_1(1/A_{t-1}) + \alpha_2((\Delta REV_t - \Delta REC_t)/A_{t-1})) + \alpha_3(PPE_t/A_{t-1}) + \varepsilon_t \quad (1)$$

where:

TA_t is total accruals in year t;
ΔREV_t is revenues in year t less revenues in year $t-1$;
ΔREC_t is net receivables in year t less net receivables in year $t-1$;
PPE_t is gross property plant and equipment at the end of year t;
A_{t-1} is total assets at the end of year $t-1$;
α_1, α_2 and α_3 are the parameters to be estimated; and
ε_t is the error term.

While the standard approach in the literature is to perform cross-sectional estimations of Equation *(1)* at the industry level, Francis & Wang (2008) pointed out the shortcomings of such an approach in international settings, due to the generally low number of industry observations per year. To overcome this limitation, following Mora & Sabater (2008) we perform industry panel estimations of Equation *(1)* with firm and year specific fixed effects.

Next, we conduct a multivariate analysis of discretionary accruals with the control variables used in prior related studies, particularly in Chi & Chin (2011). Hence, we estimate the model given by Equation *(2)* below. The main analysis is conducted with discretionary accruals in absolute values (*ABSDA*) as the dependent variable. However, as it is usual in the accounting literature we perform additional estimations with both raw (*DA*) and income-increasing discretionary accruals (*IIDA*) as the dependent variables. To measure industry specialization, industries are defined according to the classification of the National Securities Market Commission (*Comisión Nacional del Mercado de Valores*, CNMV). We provide three alternative proxies of partner's industry specialization. For the first proxy, *INDSPEC1*, we calculate the partner's market share in the industry, rank all the partners in the industry and define as industry specialist the two partners at the top of the ranking (e.g., Chi and Chin, 2011). For the second proxy, INDSPEC2, we calculate the number of clients of the partner in

the industry and define as industry specialist the partner with the highest number of clients (e.g., Chin & Chi, 2009 and Chin, Yao & Liu, 2014). Finally, we define *INDSPEC3* as the market share of the partner in the industry (e.g., Goodwin & Wu, 2014).

$$ABSDA_{i,t} = \beta_0 + \beta_1 INDSPEC_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 AGE_{i,t} + \beta_4 CFFO_{i,t} + \beta_5 ACCR_{i,t-1} + \beta_6 LEVERAGE_{i,t} + \beta_7 GROWTH_{i,t} + \beta_8 FIRMTENURE_{i,t} + \beta_9 AUDFIRM_{i,t} + \gamma\ Industry\ dummies_{i,t} + \delta\ Year\ dummies_{i,t} + \mu_{i,t} \quad (2)$$

where,

Dependent variable:

$ABSDA_{i,t}$ in the main analysis. *DA* and *IIDA* in the additional analyses.

Experimental variable (*INDSPEC*):

INDSPEC1 $_{i,t}$: 1 if the lead audit partner is an industry specialist (based on market share) and 0 otherwise;
INDSPEC2 $_{i,t}$*:* 1 if the lead audit partner is an industry specialist (based on the number of clients) and 0 otherwise.
INDSPEC3 $_{i,t}$*:* the market share of the partner in the industry based on clients' sales.

Control variables:

SIZE $_{i,t}$: natural logarithm of total assets at the end of the year;
AGE $_{i,t}$: natural logarithm of the number of years the client has been listed on the Spanish stock market;
CFFO $_{i,t}$: cash flow from operations scaled over total assets at the beginning of the year;
ACCR $_{i,t-1}$*:* previous year's total accruals scaled by total assets;
LEVERAGE $_{i,t}$: total liabilities divided by total assets at the end of the year;
GROWTH $_{i,t}$: change in total assets from prior year;
FIRMTENURE $_{i,t}$: number of consecutive years the client has been audited by the same audit firm; and
AUDFIRM $_{i,t}$: a dichotomous variable which takes the value of 1 if the audit firm is a Big 4 auditor and 0 otherwise.

Firm and year dummies:

Eight year-dummies and five industry-dummies are included in the model.

As pointed out by Causholli et al. (2010), the choice of the indicator to measure market shares might significantly affect the reported results. Hence, the use of the size of the client (in terms of either sales or assets) or audit fees will produce a bias towards Big 4 auditors (which audit the largest clients), while market shares based on the number of clients will allow the identification of some smaller auditors as specialists. Moreover, the identification of industry specialist as the partner (or two partners) with the highest market share in the industry is not only arbitrary (why not the three partners?) but it seems more appropriate for the

investigation of industry leadership than industry specialization. In fact, the alternative so-called "portfolio approach" (Gramling & Stone, 2001) to identify industry specialist allows for a large number of industry specialists. The results of Audousset-Coulier, Jeny & Jiang (2016) indicate that this is an important issue to consider.

The control variables in Equation *(2)* are widely used in the accounting literature (e.g. Chin & Chi, 2011) as determinants of discretionary accruals. Large firms (*SIZE*) are expected to show lower levels of discretionary accruals (e.g. Watts & Zimmerman, 1986; Myers, Myers & Omer, 2003) and, therefore, higher audit quality. *AGE* controls for differences in accruals across the life cycle (Myers, Myers & Omer, 2003). *CFFO* is included because firms with higher cash flow from operations are more likely to be better performers (Myers, Myers & Omer, 2003), and also because accruals and cash flows tend to show negative correlation (e.g. Dechow, 1994). As Chi & Chin (2011), with *ACCR* we aim to control for the negative autocorrelation of current accruals (Ashbaugh, LaFond & Mayhew, 2003). We include *LEVERAGE* because highly levered firms face stronger incentives to manipulate earnings in order to avoid debt covenant violation. *GROWTH* is included in the model because accruals are likely to be associated with growth opportunities (e.g. Carey & Simnett, 2006). The number of years the client has been audited by the same audit firm (*FIRMTENURE*) might have opposite effects on both dimensions of DeAngelo's (1981) definition of audit quality. Hence, better client knowledge achieved in longer tenures should enhance the ability of the auditor to detect accounting misstatements. However, the independence and critical skepticism of the auditor could also be undermined in longer tenures. Most available evidence supports a positive (or non-significant) impact of audit firm tenure on audit quality (e.g. Chung & Kallapur, 2003). Finally, *AUDFIRM* is included because prior research generally shows that large audit firms tend to provide higher quality audit services (e.g. Becker et al., 1998).

3.1.2. Modified audit opinions

The issuance of a modified audit opinion constitutes another usual measure of audit quality (e.g. Carey & Simnett, 2006; Lim & Tan, 2010; Reichelt & Wang, 2010). This view is supported by the available evidence showing a higher probability of audit firm switches after a modified audit opinion (Chow & Rice, 1982; Krishnan, 1994). Therefore, the issuance of a qualified report to those firms which deserve one is taken as an indicator of higher audit quality. According to the Spanish law, the audit report has to include the opinion of the lead audit partner about the client's financial statements. This opinion can be: unqualified, qualified, unfavorable or disclaimer of opinion. Similar to Chi & Chin (2011) we consider audit

reports with either qualified, unfavorable, disclaimer of opinion, or with explanatory paragraphs expressing doubts about the future of the company, collectively as qualified reports. To test the effects of partner's industry specialization on the opinion of the audit report, we use the same logistic model as Chi & Chin (2011), given by Equation *(3)* below. The dependent variable *MAO* (modified audit opinion) is defined as a dichotomous variable which takes the value of 1 if the client receives a modified audit opinion and 0 otherwise. Similar to the analysis conducted with discretionary accruals, the experimental variable (*INDSPEC*) is defined as either *INDSPEC1, INDSPEC2, or INDSPEC3*.

$$MAO_{i,t} = \eta_0 + \eta_1 INDSPEC_{i,t} + \eta_2 SIZE_{i,t} + \eta_3 AGE_{i,t} + \eta_4 LEVERAGE_{i,t} + \eta_5 FIRMTENURE_{i,t} + \eta_6 AUDFIRM_{i,t} + \eta_7 ZMJSCORE_{i,t} + \eta_8 LOSS_{i,t} + \eta_9 CURRENTRATIO_{i,t} + \eta_{10} LAGMAO_{i,t} + \sum Industry\ dummies_{i,t} + \lambda\ Year\ dummies_{i,t} + \theta_{i,t} \quad (3)$$

Control variables in Equation *(3)* attempt to control for litigation risk as it is a major motivation in the auditor's reporting decision. In addition to the control variables already used in the analysis conducted with discretionary accruals (*SIZE, AGE, LEVERAGE, FIRMTENURE* and *AUDFIRM*), we also include:

ZMJSCORE $_{i,t}$: the adjusted Zmijewski's (1984) score;[2]
LOSS $_{i,t}$: a dichotomous variable which takes the value of 1 if the company has negative net income in the last two years and 0 otherwise;
CURRENTRATIO $_{i,t}$: current assets over current liabilities; and
LAGMAO $_{i,t}$: a dichotomous variable which takes the value of 1 if the company had a modified audit opinion the previous year and 0 otherwise.

Next we discuss the control variables proposed in Equation *(3)*. We include *SIZE* because the size of the client might affect the auditor's propensity to issue a modified audit opinion. On the one hand, the positive relationship between client's size and litigation costs for the audit firm (Lys & Watts, 1994; Shu, 2000) could make modified opinions more likely for large clients. However, on the other hand, large companies are expected to show higher accounting quality (e.g. Myers, Myers & Omer, 2003) and also more negotiating power with the audit firm to avoid a qualified report. Therefore, we do not predict the sign of *SIZE*. *AGE* captures the higher likelihood of financial distress (and litigation risk for the audit firm) of companies with a short listing history (Dopuch, Holthausen & Leftwich, 1987; Chin & Chi, 2011). Accordingly, we predict a negative sign for *AGE*. Similar to the analysis conducted using discretionary accruals, the effects of *FIRMTENURE* could be either positive or negative. Long-tenured auditors have a better knowledge of the client, and thus they should be better able to detect accounting misstatements which might deserve a modified opinion. However, auditor independence might also be impaired in lengthy engagements with the audit firm through a bonding effect. Thus, we do not predict a sign for *FIRMTENURE*. Following Carey & Simnett (2006), among

others, we include *AUDFIRM* to capture any differences in the propensity of issuing modified audit opinions by Big 4 auditors. *LEVERAGE, ZMJSCORE, LOSS* and *CURRENTRATIO* are indicators of the client's financial health, and therefore they account for the litigation risk faced by the auditor. Hence, high levels of debt (*LEVERAGE*) make bankruptcy more likely and consequently raise litigation risk. The Zmijewski score (*ZMJSCORE*) is a usual proxy of the probability of bankruptcy (Krishnan & Krishnan, 1997; Carey & Simnett, 2006). Similar to Chi & Chin (2011), we include *LOSS* to complement the *ZMJSCORE*, as the latter specifies variables only for the current period and *LOSS* is used to indicate companies with a two-year trend of negative earnings. According to prior research (Dopuch, Holthausen & Leftwich, 1987), firms with losses face higher probabilities of audit qualifications. On the contrary, higher levels of liquidity (*CURRENTRATIO*) should make modified opinions less likely. Thus, we expect positive coefficients for *LEVERAGE, ZMJSCORE* and *LOSS* and a negative coefficient for *CURRENTRATIO*. Finally, we include *LAGMAO* to control for a higher likelihood of modified opinions to those companies who had a qualified report the previous year (e.g. Reynolds & Francis, 2000; Chi & Chin, 2011). Therefore, we predict a positive coefficient for *LAGMAO.*

3.2. Sample selection

Our sample is formed by non-financial companies listed on the Spanish stock market[3] for the nine-year research period: 2005-2013. The names of engagement partners and audit firms were obtained from financial statements available at the *Comisión Nacional del Mercado de Valores*'s (CNMV) website. Financial data were obtained from Standard and Poor's Capital IQ database. Experimental variables *INDSPEC1, INDSPEC2* and *INDSPEC3* were hand created with the information available at the registers of the CNMV. The sample was initially formed by 101 firms and 909 firm-year observations (given the nine-year research period). However, for five firms in the sample, information was not available for the entire research period, as they joined or left the stock market at some point during the period. This situation led to the loss of 11 firm-year observations. Moreover, for 43 firm-year observations, information about at least one independent variable was missing. Thus, Equation *(2)* has been estimated with a sample of 855 firm-year observations. In the analysis conducted with the opinion of the audit report as the proxy for audit quality (Equation *(3)*), we lost 39 additional firm-year observations for this same reason. Therefore, this analysis has been conducted with a sample of 816 firm-year observations.

4. EMPIRICAL RESULTS

4.1. Descriptive statistics

Table 1 provides some information about the dataset used in the empirical analysis. The examination of average values for the experimental variables (*INDSPEC1, INDSPEC2* and *INDSPEC3*) seems to support the conclusion of Audousset-Coulier, Jeny & Jiang (2016) that the use of different proxies of industry specialization results in inconsistent classifications of auditors as specialists. The rather high value for *INDSPEC1* compared to Chi & Chin, 2011 is mainly explained by the relatively small size of the Spanish stock market. Results for control variables show that the average audit firm tenure (ten years) in Spain is fairly high by international standards[4]. We also report an extraordinarily high degree of concentration of the Spanish audit market for listed companies by Big-4 firms, as 91 percent of the audit reports have been signed by partners of Big-4 firms[5].

Insert Table 1 about here

The correlation matrix for the variables included in Equation *(2)*[6] is displayed in Table 2. Discretionary accruals show negative (though non-significant) correlation with the industry specialization of lead audit partners, no matter how industry specialization is measured. Thus, this result does not suggest significantly higher audit quality for those companies audited by industry-specialist partners. Still for the experimental variables, we observe positive and significant correlation of all three variables with *SIZE* and *BIG4*, indicating that large clients tend to be audited by industry specialist partners and that large audit firms tend to have more industry specialized partners, respectively. Both results seem rather reasonable. Moreover, while *INDSPEC3* shows positive and significant correlation with both *INDSPEC1* and *INDSPEC2*, the latter do not show significant correlation between them. This result reinforces our former view regarding inconsistent classifications of auditors as industry specialists depending on the variable used to measure industry specialization. Focusing on control variables, discretionary accruals are positively and significantly correlated with *LEVERAGE* and *GROWTH* and negatively and significantly correlated with *SIZE*, *AGE*, *CFFO*, *ACCR*, *FIRMTENURE* and *AUDFIRM*. This correlation pattern strongly fits our expectations. As we do not observe too high levels of correlation across pairs of independent variables (the maximum Pearson correlation coefficient between any pair of independent variables is 0.52), we do not expect serious multicollinearity problems in the estimations of the models.

Insert Table 2 about here

4.2. Discretionary accruals

Table 3 shows the results of the estimations of Equation *(2)*. The dependent variable is the absolute value of discretionary accruals in all three estimations, while the experimental variable is *INDSPEC1* in Model 1, *INDSPEC2* in Model 2 and *INDSPEC3* in Model 3. Consistently with the panel structure of our dataset, estimations are performed using panel data models. Moreover, the Hausman test supports the use of random effects models. In order to control for the presence of outliers, all estimations are conducted with variables winsorized at the top and bottom one percent. As we have detected heteroscedasticity in the dataset, significance tests are performed with robust standard errors.

Insert Table 3 about here

As shown by Table 3, all three estimations are statistically significant (*P-value* < 0.00). Moreover, the proposed models present relatively high explanatory power compared to prior research (29 percent R-squared, compared to 16 percent in Chi & Chin, 2011). The main result in the Table is be the lack of a significance impact of partner's industry specialization on discretionary accruals. Accordingly, industry specialization of individual auditors does not seem to lead to higher levels of audit quality in the Spanish audit market. This result appears as rather robust as it holds independently on how industry specialization is measured and contradicts most previous studies showing a positive impact of the industry specialization of individual auditors on audit quality. However, it should be noted that in the most similar studies to ours (Chi & Chin, 2011 and Chi et al., 2017) the effects of industry specialization on audit quality measured by discretionary accruals appeared to be rather weak, as significance was reported only at marginal levels (*P-value* < 0.10).

Results for control variables strongly meet our expectations, as whenever a significant effect is observed it is always in the predicted direction. Hence, large (*SIZE*) and well-established (*AGE*) firms tend to show lower levels of discretionary accruals and, thus, higher audit quality. Similarly, we report a negative and significant effect of operating cash flows (*CFFO*) on discretionary accruals. We had also predicted the positive effects observed for *GROWTH* and *LEVERAGE*. Moreover, clients of Big-4 audit firms (*AUDFIRM*) show significantly lower discretionary accruals (in Models 1 and 3) and, thus, higher audit quality. However, we do not report significant results for *ACCR* or *FIRMTENURE*.

To further check the robustness of our main results we reestimate Equation *(2)* with alternative definitions of discretionary accruals as a sensitivity analysis. While most prior

studies using discretionary accruals as the proxy for audit quality have defined accruals in absolute values, some authors have used raw discretionary accruals or income-increasing discretionary accruals. In some cases, the new variables complement the analysis conducted with discretionary accruals in absolute values (Myers, Myers & Omer, 2003; Carey & Simnett, 2006), while in others they are used as an alternative (Francis & Wang, 2005). The rationale for using raw or income-increasing discretionary accruals relies on the different implications of income-increasing and income-decreasing earnings management activities. Hence, earnings management through income decreasing discretionary accruals might in fact indicate higher audit quality as it is associated with stronger accounting conservatism. Accordingly, we have performed sequential estimations of Equation *(2),* first with raw discretionary accruals (*DA*) as the dependent variable and then with income-increasing discretionary accruals (*IIDA*). The results of the new estimations (not reported) support the main findings in Table 3. In none of the six new estimations we are able to report statistical significance for any of the experimental variables at the usual levels (*P-value* < 0.05). However, in the estimation conducted with raw discretionary accruals and the experimental variable *INDSPEC3* we report marginally significant results (*P-value* < 0.10) with the expected negative sign.

4.3. The opinion of the audit report

According to the nature of the dependent variable and the panel structure of the dataset this analysis is conducted through panel data logistic estimations of Equation *(3)* with random effects. Results are shown in Table 4. The log-likelihood ratio test (not reported) supports panel data estimations over the alternative pooled logistic approach in all the estimations. Besides, all three models are globally significant with 47 percent Pseudo R-squared, very much in line with Chi & Chin (2011) (46 percent). The main result in Table 4 is the lack of significant effects for any of the proxies of industry specialization. Thus, the industry specialization of lead partners does not significantly affect audit quality as measured by the likelihood of issuing a modified audit opinion to those companies which deserve it. Like the former analysis conducted with discretionary accruals as the proxy of audit quality, this result seems quite robust as it holds independently of how industry specialization is measured.

Previous related study using the opinion of the audit report as the proxy of audit quality have provided mixed results. Hence, for the Taiwanese audit market Chi & Chin (2011) found that clients of industry specialized partners face a higher likelihood of receiving a modified audit opinion. However, the results of Chen, Sun & Wu (2010) for China do not indicate a significant relationship between industry specialization and the opinion of the audit report. We

do not have a direct explanation for these different results, beyond the institutional differences between the Spanish, Taiwanese and Chinese audit markets and the different research periods used in these papers. While the three countries can be considered as low litigation risk markets, the motivations of the individual auditors to issue a modified audit report could still be different. Interestingly, in the sample used in Chi & Chin (2011) less than five percent of the audit reports had a modified audit opinion. However, in Chen, Sun & Wu (2010) this percentage jumps to 14 percent and to a similar 16 percent in our paper. These differences do not only indicate that modified audit opinions are much rarer in Taiwan than they are in Spain or China, but it might also suggest differences in the motivations of individual auditors to issue a modified audit opinion.

Insert Table 4 about here

Similar to the analysis conducted using discretionary accruals, results for control variables strongly meet our expectations, as whenever a significant effect is reported it is always in the predicted direction. Hence, the likelihood of a modified opinion is significantly higher if the client already received a qualified report the previous year (*LAGMAO*). Moreover, audit qualifications are more likely for small clients (*SIZE*), as well as for those clients showing high levels of financial leverage (*LEVERAGE*), low liquidity (*CURRENTRATIO*) or poor solvency (*ZMJSCORE*). However, we do not report significance for *AGE, FIRMTENURE, AUDFIRM or LOSS*.

5. CONCLUDING REMARKS

The main result of this study is that industry specialization of individual auditors does not show a significant impact on audit quality. Neither the level of discretionary accruals of auditors' clients nor the likelihood of a modified opinion in the audit report are significantly affected by the industry specialization of lead audit partners. This result appears to be robust as it holds independently on how industry specialization or audit quality are measured. Regarding this point, a distinguishing feature of this study compared to prior research is the various proxies of industry specialization and audit quality used in the empirical analysis. Overall, our results appear to contradict most previous studies which agree on a positive impact of the industry specialization of lead partners on audit quality. It should be noted, however, that according to Audousset-Coulier, Jeny & Jiang (2016), because of the diversity of research settings (i.e. countries, research periods and model specifications), it is difficult to compare the results reported by different studies.

The evidence reported here might be of interest for several reasons. Firstly, as our results oppose those obtained in other audit markets, they stress the importance of the research setting and encourage further research, particularly on previously not investigated countries. Moreover, it should be noted that the available research is not only scarce but also heavily concentrated on the Taiwanese audit market. Therefore, we adhere to Bedard's (2012) claim encouraging further research on other jurisdictions that currently require (or will require in the future) the signature of lead audit partners on the audit report. Secondly, although our results might put into question the actual role of the individual auditor in the quality of the audit services provided, we do not think that this is the case, given the quickly growing amount of evidence supporting the important role of audit partners as determinants of audit quality. Finally, at a more practical level, the lack of significant effects of the industry specialization of audit partners indicates that audit firms do not face strong incentives to promote the specialization of partners at the industry level, as specialized partners do not seem to provide higher-quality audit services.

This paper is subject to several limitations. Similar to previous studies, our measures of specialization only account for the audit reports of public companies signed by the lead partner. Therefore, non-public clients of audit partners have not been considered in the analysis. In the same vein, as is usual in the literature, industry specialization measures only take into account the current portfolio of clients of the audit partner. Regarding this latter point, the inclusion of past audit experience of the partner on the building up of industry specialization indicators might provide an interesting extension of this research. Finally, the relatively small size of the Spanish stock market makes that some industries include a too low number of firms. These limitations need to be considered when interpreting the reported results.

NOTES

[1] Other reasons suggested by Bedard (2012) for replication studies are that the importance of lead audit partners as a determinant of audit quality is essentially an empirical question and the concerns about reliability and generalizability of prior research findings due to methodological issues.

[2] *ZMJSCORE* is calculated based on book values of return on assets, debt to assets, and the current ratio. See Carcello, Hermanson & Fuss (1995) for a description of the exact procedure for computing the score.

[3] All companies in the sample are quoted in the Spanish continuous market. This market is formed by the largest and most representative Spanish public companies and it represents more than 95 percent of the total trading volume of the Spanish stock market.

[4] For example, if compared with Taiwan (less than six years in Chi & Chin, 2011).

[5] This market share is much higher than in the US (68 percent in Audousset-Coulier, Jeny & Jiang, 2016) or Australia (64 percent in Carey & Simnett, 2006).

[6] For the sake of simplicity and because most variables are the same in the analysis conducted with discretionary accruals and in the analysis conducted with the opinion of the audit report, we only report the correlation matrix for the former.

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Table 1. Descriptive statistics for the independent variables

Panel A. Analysis conducted with discretionary accruals (855 firm-year observations)

VARIABLE	MEAN	MEDIAN	ST. DEV.	MAXIMUM	MINIMUM
INDSPEC1	0.43	0.00	0.50	1.00	0.00
INDSPEC2	0.16	0.00	0.42	1.00	0.00
INDSPEC3	0.23	0.13	0.25	0.99	0.00
SIZE	6.85	6.66	1.79	13.27	1.58
AGE	2.65	2.94	0.64	3.33	0.00
CFFO	0.06	0.06	0.14	0.86	-2.02
ACCR	-0.04	-0.04	0.17	3.23	-0.74
LEVERAGE	0.67	0.67	0.29	3.43	0.01
GROWTH	1.48	1.05	5.98	139.52	0.07
FIRMTENURE	10.06	9.00	6.82	27.00	1.00
AUDFIRM	0.91	1.00	0.29	1.00	0.00

Panel B. Analysis conducted with the opinion of the audit report (816 firm-year observations)

VARIABLE	MEAN	MEDIAN	ST. DEV.	MAXIMUM	MINIMUM
INDSPEC1	0.44	0.00	0.50	1.00	0.00
INDSPEC2	0.15	0.00	0.42	1.00	0.00
INDSPEC3	0.24	0.15	0.25	0.99	0.00
SIZE	6.93	6.75	1.77	13.27	2.71
AGE	2.65	2.94	0.64	3.33	0.00
LEVERAGE	0.66	0.66	0.25	3.43	0.01
FIRMTENURE	10.28	9.00	6.86	27.00	1.00
AUDFIRM	0.92	1.00	0.28	1.00	0.00
ZMJSCORE	-2.07	-1.98	1.65	2.91	-9.97
LOSS	0.20	0.00	0.40	1.00	0.00
CURRENTRATIO	1.42	1.17	1.30	20.00	0.08
LAGMAO	0.14	0.00	0.35	1.00	0.00

INDSPEC1: 1 if the lead audit partner is an industry specialist based on clients' sales and 0 otherwise; *INDSPEC2:* 1 if the lead audit partner is an industry specialist based on the number of clients and 0 otherwise; *INDSPEC3*: the market share for the partner in the industry based on clients' sales; *SIZE*: natural logarithm of total assets; *AGE*: natural logarithm of the number of years the client has been listed on the Spanish stock market; *CFFO*: cash flow from operations scaled over total assets; *ACCR:* previous year's total accruals scaled by total assets; *LEVERAGE*: total liabilities divided by total assets; *GROWTH*: change in total assets from prior year; *FIRMTENURE*: number of consecutive years the client has been audited by the same audit firm; *AUDFIRM*: a dichotomous variable which takes the value of 1 if the audit firm is a Big 4 auditor and 0 otherwise; *ZMJSCORE*: adjusted Zmijewski score; *LOSS*: 1 if the company has negative net income in the last two years and 0 otherwise; *CURRENTRATIO*: current assets over current liabilities; and *LAGMAO*: 1 if the company received a modified audit opinion the previous year and 0 otherwise.

Table 2. Pearson correlations and levels of significance

	ABSDA	SIZE	AGE	CFFO	ACCR	LEVERAGE	GROWTH	FIRMTENURE	AUDFIRM	INDSPEC1	INDSPEC2
SIZE	-0.11***										
AGE	-0.16***	0.13***									
CFFO	-0.47***	0.09***	0.01								
ACCR	-0.14***	-0.01	-0.01	-0.52***							
LEVERAGE	0.10***	0.20***	0.03	-0.08**	-0.32***						
GROWTH	0.35***	-0.02	-0.05	-0.32***	0.21***	0.02					
FIRMTENURE	-0.12***	0.16***	0.19***	0.06*	0.03	-0.05	-0.06*				
AUDFIRM	-0.20***	0.20***	-0.05	0.12***	0.02	0.17***	-0.09**	0.22***			
INDSPEC1	-0.04	0.34***	0.05	-0.01	0.04	0.03	0.00	0.04	0.10***		
INDSPEC2	-0.05	0.13***	-0.15***	-0.02	-0.01	0.14***	-0.02	0.09***	0.12***	-0.02	
INDSPEC3	-0.03	0.59***	0.08**	0.09***	0.05	0.02	-0.03	0.05	0.14***	0.43***	0.17***

*, **, *** Significant at 10 percent, five percent and one percent levels, respectively.

ABSDA: discretionary accruals in absolute values*; SIZE*: natural logarithm of total assets; *SIZE*: natural logarithm of total assets; *AGE*: natural logarithm of the number of years the client has been listed by the supervisor of the Spanish stock market; *CFFO*: cash flow from operations scaled over total assets; *ACCR:* previous year's total accruals scaled by total assets; *LEVERAGE*: total liabilities divided by total assets; *GROWTH*: change in total assets from prior year; *FIRMTENURE*: number of consecutive years the client has been audited by the same audit firm; *AUDFIRM*: a dichotomous variable which takes the value of 1 if the audit firm is a Big 4 auditor and 0 otherwise; *INDSPEC1:* 1 if the lead audit partner is an industry specialist based on clients' sales and 0 otherwise; *INDSPEC2:* 1 if the lead audit partner is an industry specialist based on the number of clients and 0 otherwise; and *INDSPEC3*: the market share for the partner in the industry based on clients' sales.

Table 3. Results of the multivariate analysis of the effects of industry specialization on discretionary accruals in absolute values. Experimental variable: *INDSPEC1* (Model 1), *INDSPEC2* (Model 2) and *INDSPEC3* (Model 3)

Variable	Pred. sign	Model 1	Model 2	Model 3
INDSPEC1	-	-0.002 (-0.27)		
INDSPEC2	-		-0.002 (-0.26)	
INDSPEC3	-			-0.000 (-0.01)
SIZE	-	-0.008 (-3.34) ***	-0.008 (-3.62) ***	-0.007 (-2.76) ***
AGE	-	-0.012 (-1.72) *	-0.013 (-1.85) *	-0.012 (-1.67) *
CFFO	-	-0.162 (-3.18) ***	-0.162 (-2.62) ***	-0.162 (-3.12) ***
ACCR	-	-0.033 (-0.50)	-0.034 (-0.45)	-0.033 (-0.50)
LEVERAGE	+	0.046 (2.19) **	0.046 (2.12) **	0.047 (2.16) **
GROWTH	+	0.028 (3.10) ***	0.028 (3.62) ***	0.028 (3.07) ***
FIRMTENURE	+/-	0.003 (0.88)	0.003 (0.81)	0.003 (0.80)
AUDFIRM	-	-0.027 (-1.82) *	-0.027 (-1.50)	-0.026 (-1.76) *
Constant		0.204 (4.89) ***	0.205 (5.75) ***	0.205 (4.66) ***
Industry effects		YES	YES	YES
Year effects		YES	YES	YES
N R-sq. Wald-Chi sq.		855 0.29 94.67 ***	855 0.29 89.69 ***	855 0.29 87.98 ***

* ,** ,*** Statistical significance at the ten percent, five percent and one percent, respectively.

INDSPEC1: 1 if the lead audit partner is an industry specialist based on clients' sales and 0 otherwise; *INDSPEC2:* 1 if the lead audit partner is an industry specialist based on the number of clients and 0 otherwise; *INDSPEC3*: the market share for the partner in the industry based on clients' sales; *SIZE*: natural logarithm of total assets; *AGE*: natural logarithm of the number of years the client has been listed on the Spanish stock market; *CFFO*: cash flow from operations scaled over total assets; *ACCR:* previous year's total accruals scaled by total assets; *LEVERAGE*: total liabilities divided by total assets; *GROWTH*: change in total assets from prior year; *FIRMTENURE*: number of consecutive years the client has been audited by the same audit firm; *AUDFIRM*: a dichotomous variable which takes the value of 1 if the audit firm is a Big 4 auditor and 0 otherwise.

Table 4. Results of the multivariate analysis of the effects of industry specialization on the opinion of the audit report. Experimental variable: *INDSPEC1* (Model 1), *INDSPEC2* (Model 2) and *INDSPEC3* (Model 3)

Variable	Pred. sign	Model 1	Model 2	Model 3
INDSPEC1	+	0.354 (1.01)		
INDSPEC2	+		0.425 (0.41)	
INDSPEC3	+			-0.432 (-0.79)
SIZE	+/-	-0.713 (-4.30) ***	-0.714 (-3.93) ***	-0.678 (-4.24) ***
AGE	-	-0.328 (-0.86)	-0.326 (-0.86)	-0.354 (-0.93)
LEVERAGE	+	2.050 (1.82) *	1.098 (1.77) *	2.014 (1.80) *
FIRMTENURE	+/-	0.212 (1.01)	0.213 (1.02)	0.201 (0.97)
AUDFIRM	+	-0.708 (-1.29)	-0.713 (-1.29)	-0.684 (-1.26)
ZMJSCORE	+	0.783 (3.51) ***	0.785 (3.52) ***	0.769 (3.46) ***
LOSS	+	0.493 (1.17)	0.519 (1.23)	0.488 (1.16)
CURRENTRATIO	-	-0.533 (-2.30) **	-0.534 (-2.29) **	-0.546 (-2.34) **
LAGMAO	+	2.431 (6.00) ***	2.373 (5.81) ***	2.400 (5.92) ***
Constant		5.039 (2.41) **	5.141 (2.45) **	5.129 (2.47) **
Industry Effects		YES	YES	YES
Year Effects		YES	YES	YES
N Pseudo R-sq. Wald-Chi sq.		816 0.47 109.98 ***	816 0.47 110.58 ***	816 0.47 111.60 ***

* ,** ,*** Statistical significance at the ten percent, five percent and one percent, respectively.

INDSPEC1: 1 if the lead audit partner is an industry specialist based on clients' sales and 0 otherwise; *INDSPEC2:* 1 if the lead audit partner is an industry specialist based on the number of clients and 0 otherwise; *INDSPEC3*: the market share for the partner in the industry based on clients' sales; *SIZE*: natural logarithm of total assets; *AGE*: natural logarithm of the number of years the client has been listed on the Spanish stock market; *LEVERAGE*: total liabilities divided by total assets; *FIRMTENURE*: number of consecutive years the client has been audited by the same audit firm; *AUDFIRM*: a dichotomous variable which takes the value of 1 if the audit firm is a Big 4 auditor and 0 otherwise; *ZMJSCORE*: adjusted Zmijewski score; *LOSS*: 1 if the company has negative net income in the last two years and 0 otherwise; *CURRENTRATIO*: current assets over current liabilities; and *LAGMAO*: 1 if the company received a modified audit opinion the previous year and 0 otherwise.