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Audit partner industry specialization and audit quality: Evidence from Spain

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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 research period between 2005 and 2013. Our main result is the lack of a significant impact of the industry specialization of audit partners on audit quality. This result seems sound, as it holds for the several measures of industry specialization and audit quality used in the empirical study. Our main result, which contradicts most of the scarce available evidence, would stress the importance of the institutional context in the study of the industry specialization–audit quality relationship and advocates the need for further research.

KEYWORDS

Audit quality, audit services, auditor expertise, auditor reputation, discretionary accruals, industry specialization, lead audit partner, learning process

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 competent (to be able to identify accounting misstatements) and independent (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. Since individual auditors differ in terms of their incentives and attributes such as risk preference, expertise, ability, or cognitive style (Gul, Wu, & Yang, 2013), they 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 (Gul et al., 2013; Jeppesen, 2007). A quickly growing number of empirical studies have addressed the role of individual auditors as determinants of audit quality (e.g., Aobdia, Lin, & Petacchi, 2015; Carey & Simnett, 2006; Garcia-Blandon & Argiles, 2017; Gul et al., 2013; Knechel, Vanstraelen, & Zerni, 2015). While the industry specialization of audit firms has attracted a lot of attention (e.g., Balsam, Krishnan, & Yang, 2003; Carson, 2009; Casterella,

Francis, Lewis, & Walker, 2004; Craswell, Francis, & Taylor, 1995; DeFond, Francis, & Wong, 2000; Dunn & Mayhew, 2004), few papers have investigated how the industry specialization of individual auditors impacts audit quality (Chi & Chin, 2011; Chin & Chi, 2009; Chin, Yao, & Liu, 2014; Goodwin & Wu, 2014; Zerni, 2012). These studies generally agree that industry specialization of both the audit firm and audit partners enhances audit quality. Owing to the data availability, evidence at the individual auditor level is limited to just four countries: Taiwan (Chi & Chin, 2011; Chi, Myers, Omer, & Xie, 2017; Chin et al., 2014; Chin & Chi, 2009), Sweden (Zerni, 2012), Australia (Goodwin & Wu, 2014) and China (Chen, Sun, & Wu, 2010).

DeFond and Francis (2005) encouraged to further investigate audit quality at the partner level in those markets with available data. Chen et al.'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 even more explicit in Bedard (2012), who advocated for replication studies in any jurisdiction currently requiring engagement partner signature. The author 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 intends to contribute to the 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 audit report opinions. We perform the empirical analysis with a sample of Spanish listed companies for the period between 2005 and 2013. While our paper shares important similarities with Chi and Chin (2011), the main difference apart from the country investigated is that, unlike the single indicator of industry specialization used by these authors, with the aim of providing a more comprehensive analysis of industry specialization we use several measures of specialization. According to Audousset-Coulier, Jeny, and Jiang (2016), the measurement of industry specialization is of utmost importance for the empirical analysis. As the level of industry specialization is not observable, researchers have to provide indirect proxies for this concept. A main finding in Audousset-Coulier et al. (2016) is that the use of different industry specialization proxies results in inconsistent classifications of auditors as specialists.[2] Therefore, the use of the widest possible set of industry specialization indicators seems essential in order to obtain robust results.

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

The remainder of the paper is structured as follows. Section 2 discusses the available evidence on the relationship between industry specialization and audit quality. Section 3 presents the design of the empirical analysis and the selection of the sample. In Section 4 we report and discuss the results of the research, and we draw conclusions in Section 5.

2 | REVIEW OF THE LITERATURE AND RESEARCH QUESTION

2.1 | Industry specialization and audit quality

Following Audousset-Coulier et al. (2016), there is no consensus on the best proxy for industry specialization. This is due to the very complexity of the industry specialization concept, which the different proposed measures fail to capture adequately. 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 in the proxy for industry specialization. According to Audousset-Coulier et al. (2016), while most papers use the market share of the auditor in the industry (e.g., Chi & Chin, 2011; Ferguson, Francis, & Stokes, 2003; Kwon, Lim, & Tan, 2007; Zerni, 2012), some others 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 & Willekens, 2012). A second important difference is that, no matter whether the study follows a market or a portfolio share approach, researchers use a variety of measures (i.e., audit fees, client size, or number of clients) to compute auditors' 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., Chi & Chin, 2011), auditors with industry market shares 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 in the proxy for audit quality, as they use discretionary accruals (e.g., Balsam et al., 2003; Gul, Fung, & Jaggi, 2009), audit report opinions (e.g., Lim & Tan, 2008; Reichelt & Wang, 2010), earnings response coefficients (e.g., Kwon et al., 2007; Lim & Tan, 2008), reports of financial frauds (Carcello & Nagy, 2004), or audit fees (e.g. DeFond et al., 2000; Ferguson et al., 2003; Goodwin & Wu, 2014; Zerni, 2012). Similar to what occurs with industry specialization, the several proxies for audit quality all are subject to one limitation or another. Most of these studies agree that industry specialization is associated with higher audit quality. In the same vein, some (e.g., Basioudis & Francis, 2007; Ferguson et al., 2003; Francis, Reichelt, & Wang, 2005) have argued that industry expertise is more based on office-level industry leadership than on national-level industry leadership.

Audousset-Coulier et al. (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 for auditor market and portfolio shares, the use of various criteria to classify auditors as industry specialists, and, we would also add, the lack of consensus on the best proxy of audit quality (Francis, 2004) not only make it difficult to compare and interpret the reported results, but they also raise questions on the reliability and validity of these same results.

2.2 | Evidence at the audit partner level

Focusing on the industry specialization of lead audit partners, a preliminary issue is the very role of individual auditors. In countries such as Spain requiring the signature of the lead audit partner, 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 that has included various levels of specificity, from global audit firm networks to local offices. The next step in this progression is the analysis of the influence of lead audit partner characteristics on 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 et al., 2013; Knechel et al., 2015), as it shows the importance of some personal characteristics of the auditor (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 et al. (1995) pointed out that, to ensure the quality of audit services, auditors need some specific knowledge to complement generic accounting and audit knowledge. Bonner and Lewis (1990) investigated the relative importance of different types of knowledge and abilities to explain individual auditors' performances. They concluded that general audit experience (a measure of generic knowledge) plays a relatively minor role compared with both task-specific training and experience and innate ability. In the same line, Ashton (1991) found that industry audit experience (a measure 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 industries 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 et al., 2017; Chi & Chin, 2011), the likelihood of a modified opinion in the audit report (Chen et al., 2010; Chi & Chin, 2011), audit fees (Goodwin & Wu, 2014; Zerni, 2012), the ownership structure of syndicated loans (Chin et al., 2014), and interest spreads on loans (Chi et al., 2017). These articles tend to agree that the industry specialization of audit partners contributes to the building up of expertise and, thus, to higher quality audit services.[3]

Most studies on a partner's industry specialization have investigated the Taiwanese audit market. Chin and 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 and Chin (2011) showed a 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 nonsignificant effects on interest rate spreads. Still, for Taiwan, Chin et al. (2014) found that lenders value partner industry audit experts when structuring the ownership of syndicated loans, concluding that they would infer audit quality from the characteristics of the signing audit partners. Chen et al. (2010) investigated the Chinese audit market and reported a nonsignificant impact of industry specialization on audit quality, as proxied by the opinion of the audit report.

With a sample of Swedish companies, Zerni (2012) studied the effects of a 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 a differentiation strategy involving different levels of audit quality and of audit fees. It should be noted, however, that Bedard (2012) warned about the serious shortcomings of audit fees as a valid proxy for audit quality.

Finally, the evidence reported by Goodwin and Wu (2014) for the Australian audit market shows that a partner's industry specialization is highly significant and economically important. Similar to Zerni (2012),

they use audit fees as the proxy for audit quality. Interestingly, the authors also found that the 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 the impact of the industry specialization of lead audit partners on 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, the peculiarities of the Spanish audit market need to be taken into account when examining the industry specialization–audit quality relationship. First, the Spanish audit market is a low litigation risk market (Ruiz-Barbadillo, Gómez-Aguilar, De Fuentes-Barberá, & García-Benau, 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 compared with high-litigation-risk countries. Second, the rotation of lead audit partners after a maximum of seven consecutive years with the same client was mandatory during our research period.

3 | RESEARCH DESIGN AND SAMPLE SELECTION

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

3.1 | Research design

3.1.1 | Discretionary accruals

As is usual in the accounting and auditing literature, we proxy the quality of audit services by discretionary accruals (e.g., Carey & Simnet, 2006; Gul et al., 2009; Myers, Myers, & Omer, 2003). 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, and Sweeney (1995):

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

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 difficulties of using such an approach in

many countries, 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 and Chin (2011). Hence, we estimate the model given by Equation 2. The main analysis is conducted with discretionary accruals in absolute values (ABSDA) as the dependent variable. However, as is usual in the accounting literature, we perform additional estimations with both raw discretionary accruals (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 for industry specialization. For the first proxy, INDSPEC1, we calculate partners' market share in the industry based on clients' sales, rank all partners in the industry, and define as industry specialist the two partners at the top of the ranking (e.g., Chi & 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 et al., 2014; Chin & Chi, 2009). Finally, we define INDSPEC3 as the market share of the partner in the industry based on clients' sales (e.g., Goodwin & Wu, 2014).

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

where

- Dependent variable:
  - $ABSDA_{i,t}$ in the main analysis; $DA_{i,t}$ and $IIDA_{i,t}$ in the additional analyses.
- Experimental variable (INDSPEC):
  - $INDSPEC1_{i,t}$—1 if the lead audit partner is an industry specialist (based on clients' sales) 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, De Martinis, Hay, and Knechel (2010), the choice of the indicator to measure market shares might significantly affect the reported results. Hence, taking into account the size of the client (in terms of either sales or assets) or the use of audit fees will produce a bias toward 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 somewhat arbitrary and might be 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 specialists allows for a large number of industry specialists. The results of Audousset-Coulier et al. (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., Chi & Chin, 2011) as determinants of discretionary accruals. Large firms (SIZE) are expected to show lower levels of discretionary accruals (e.g., Myers et al., 2003; Watts & Zimmerman, 1986) and, therefore, higher audit quality. AGE aims to control for differences in accruals across the life cycle (Myers et al., 2003). CFFO is included because firms with higher cash flow from operations are more likely to be better performers (Myers et al., 2003), and also because accruals and cash flows tend to be negatively correlated (e.g., Dechow, 1994). As with Chi and Chin (2011), with ACCR we aim to control for the negative autocorrelation of accruals (Ashbaugh, LaFond, & Mayhew, 2003). We include LEVERAGE because highly leveraged 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). Although the number of years the client has been audited by the same audit firm (FIRMTENURE) might have opposite effects on the competence and independence dimensions of audit quality, most evidence supports a positive (or nonsignificant) 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, DeFond, Jiambalvo, & Subramanyam, 1998).

3.1.2 | Modified audit opinions

The available evidence shows a higher probability that the client changes the audit firm after a modified audit opinion (Chow & Rice, 1982; Krishnan, 1994). Thus, the issuance of audit reports with modified audit opinions is regarded as an indicator of auditor independence and is also another usual proxy for audit quality (e.g., Carey & Simnett,

2006; Lim & Tan, 2008; Reichelt & Wang, 2010). According to Spanish law, the audit report has to include the opinion of the lead audit partner about the financial statements of the client. This opinion can be unqualified, qualified, unfavorable, or disclaimer of opinion. Similar to Chi and 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 as qualified reports. To investigate the effects of a partner's industry specialization on the opinion of the audit report, we use the same logistic model as Chi and Chin (2011), given by Equation 3. The dependent variable MAO (modified audit opinion) is defined as a dichotomous variable that 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.

$$MAO_{i,t} = \eta_0 + \eta_1 INDSPEC_{i,t} + \eta_2 SIZE_{i,t} + \eta_3 AGE_{i,t} + \eta_4 LEVERAGE_{i,t}$$

$$+ \eta_5 FIRMTENURE_{i,t} + \eta_6 AUDFIRM_{i,t} + \eta_7 ZMJSCORE_{i,t}$$

$$+ \eta_8 LOSS_{i,t} + \eta_9 CURRENTRATIO_{i,t} + \eta_{10} LAGMAO_{i,t}$$

$$+ \Sigma Industry\ dummies_{i,t} + \lambda Year\ dummies_{i,t} + \theta_{i,t} \qquad (3)$$

The control variables in Equation 3 aim to control for the litigation risk faced by the auditor when auditing a client 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 (1984) score;[4] $LOSS_{i,t}$: a dichotomous variable which takes the value of 1 if the company has negative net income in the last 2 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 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 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, larger clients are expected to show higher accounting quality (e.g., Myers et al., 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 aims to capture the higher likelihood of financial distress (and higher litigation risk for the audit firm) of companies with a short listing history (Chi & Chin, 2011; Dopuch, Holthausen, & Leftwich, 1987). Accordingly, we predict a negative sign for AGE. Similar to the former analysis conducted with discretionary accruals, the effects of FIRMTENURE could be either positive or negative. On the one hand, as long-tenured auditors have a better knowledge of the client they should thus be better able to detect accounting misstatements that 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 and

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 a 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 (Carey & Simnett, 2006; Krishnan & Krishnan, 1997). As with Chi and Chin (2011), we include LOSS to complement ZMJSCORE, as the latter specifies variables only for the current period and LOSS is used to indicate companies with a 2 year trend of negative earnings. According to prior research (Dopuch et al., 1987), firms with losses face higher probabilities of audit qualifications. Conversely, 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 already had a qualified audit report the previous year (e.g., Chi & Chin, 2011; Reynolds & Francis, 2000). Thus, we predict a positive coefficient for LAGMAO.

3.2 | Sample selection

Our sample is formed by nonfinancial companies listed on the Spanish stock market[5] for the 9-year research period: 2005–2013. The names of engagement partners and of audit firms were obtained from the clients' financial statements available at the CNMV website. Financial data were obtained from Standard & Poor's Capital IQ database. The 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 9-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 fact 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, we estimate Equation 2 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. Hence, we conduct this analysis with a sample of 816 firm-year observations.

4 | EMPIRICAL RESULTS

4.1 | Descriptive statistics

Table 1 provides some information about the dataset. The average values of the experimental variables (INDSPEC1, INDSPEC2, and INDSPEC3) seem to support the conclusion of Audousset-Coulier et al. (2016) that the use of different proxies of industry specialization generally results in inconsistent classifications of auditors as specialists. The rather high value for INDSPEC1 compared with Chi and Chin (2011) is mainly explained by the relatively small size of the Spanish stock market. Results for control variables show that the average audit

TABLE 1 Descriptive statistics for the independent variables

Variable	Mean	Median	SD	Maximum	Minimum
A. Analysis conducted with discretionary accruals (855 firm-year observations)					
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
B. Analysis conducted with the opinion of the audit report (816 firm-year observations)					
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: 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 2 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.

firm tenure in Spain (10 years) is fairly high by international standards.[6] We also report an extraordinarily high degree of concentration of the Spanish audit market for listed companies by Big-4 firms, as 91% of the audit reports are signed by partners of Big-4 firms.[7]

The correlation matrix for the variables included in Equation 2[8] is displayed in Table 2. Discretionary accruals show negative (though nonsignificant) 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. 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. As for 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 between any pair of independent variables (the maximum Pearson correlation is .59 between SIZE and INSPEC3), we do not expect serious multicollinearity problems.

4.2 | Discretionary accruals

Table 3 shows the estimates of Equation 2. The dependent variable is the absolute value of discretionary accruals in all three estimations, while the experimental variable is INDSPEC1 in column A, INDSPEC2 in column B and INDSPEC3 in column C. Consistently, with our sample characteristics, we perform panel data estimations. 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 1%. Because of the presence of heteroscedasticity in the dataset we conduct significance tests with robust standard errors.

As shown by Table 3, all three estimations are statistically significant at the usual levels (P < .00). Moreover, the proposed models present relatively high explanatory power compared with prior related research: 29% R^2 compared with 16% in Chi and Chin (2011). Nevertheless, the main result is the lack of a significance impact of a partner's industry specialization on discretionary accruals. Accordingly, the 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 industry specialization on audit quality. However, it should be noted that in the most similar studies to ours (Chi et al., 2017; Chi & Chin, 2011) 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 < .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 columns A and C), and thus higher audit quality. However, we do not report significant results for ACCR or FIRMTENURE.

TABLE 2 Pearson correlations and levels of significance

	ABSDA	SIZE	AGE	CFFO	ACCR	LEVERAGE	GROWTH	FIRMTENURE	AUDFIRM	INDSPEC1	INDSPEC2
SIZE	−.11***										
AGE	−.16***	.13***									
CFFO	−.47***	.09***	.01								
ACCR	−.14***	−.01	−.01	−.52***							
LEVERAGE	.10***	.20***	.03	−.08**	−.32***						
GROWTH	.35***	−.02	−.05	−.32***	.21***	.02					
FIRMTENURE	−.12***	.16***	.19***	.06*	.03	−.05	−.06*				
AUDFIRM	−.20***	.20***	−.05	.12***	.02	.17***	−.09**	.22***			
INDSPEC1	−.04	.34***	.05	−.01	.04	.03	.00	.04	.10***		
INDSPEC2	−.05	.13***	−.15***	−.02	−.01	.14***	−.02	.09***	.12***	−.02	
INDSPEC3	−.03	.59***	.08**	.09***	.05	.02	−.03	.05	.14***	.43***	.17***

*,
**,
***Significant at 10%, 5%, and 1% 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 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*: 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* (column a), *INDSPEC2* (column B) and *INDSPEC3* (column C)

Variable	Pred. Sign	Column A	Column B	Column C
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		855	855	855
R^2		0.29	0.29	0.29
Wald-χ^2		94.67***	89.69***	87.98***

*,
**,
***Statistical significance at the 10%, 5%, and 1% 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*: 1 if the audit firm is a Big 4 auditor and 0 otherwise.

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 define accruals in absolute values, authors have also used raw discretionary accruals and income-increasing discretionary accruals. In some cases, the new

variables complement the main analysis conducted with discretionary accruals in absolute values (Carey & Simnett, 2006; Myers et al., 2003), while in others they are used as an alternative to absolute discretionary accruals (Francis & Wang, 2008). The rationale for using raw or income-increasing discretionary accruals relies on the different types of 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) and afterwards with income-increasing discretionary accruals (IIDA) as the dependent variables. The results of the new set of estimations (not reported) support the main findings in Table 3. In none of the six new estimations are we able to report statistical significance for any of the experimental variables at the usual levels $(P < .05)$. However, in the estimation conducted with raw discretionary accruals and the experimental variable INDSPEC3 we report marginally significant results $(P < .10)$ with the predicted 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 the use of panel data estimations over the alternative pooled logistic approach in all the estimations. In addition, all three models are globally significant with 47% pseudo R^2, very much in line with Chi and Chin (2011) (46%). The main result 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 that deserve it. Like the former analysis conducted with discretionary accruals, this result seems robust as it holds independently of how industry specialization is measured.

Previous related studies using the opinion of the audit report as the proxy for audit quality have provided some mixed results. Hence, for the Taiwanese audit market, Chi and Chin (2011) found that clients of industry-specialized partners face a higher likelihood of receiving modified audit opinions. However, the results of Chen et al. (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 audit markets, the motivations of the individual auditors to issue a modified audit report could still be different in these countries. Interestingly, in the sample used in Chi and Chin (2011), less than 5% of the audit

TABLE 4 Results of the multivariate analysis of the effects of industry specialization on the opinion of the audit report. Experimental variable: INDSPEC1 (column a), INDSPEC2 (column B) and INDSPEC3 (column C)

Variable	Pred. Sign	Column A	Column B	Column C
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		816	816	816
Pseudo R^2		0.47	0.47	0.47
Wald-χ^2		109.98***	110.58***	111.60***

*,
**,
***Statistical significance at the 10%, 5%, and 1% 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: 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 2 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.

reports had a modified audit opinion. However, in Chen et al. (2010) this percentage jumps to 14% and to a similar 16% in our paper. These differences not only indicate that modified audit opinions are much rarer in Taiwan than they are in China or Spain, but it might also suggest differences in the motivations of individual auditors to issue a modified audit opinion.

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, modified opinions 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 the 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 level of industry specialization of lead audit partners. This result appears to be robust, as it holds independently of how industry specialization or audit quality are measured. 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 et al. (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. First, as our results oppose those obtained in other audit markets, they stress the importance of the research setting and encourage further research, particularly on countries not investigated so far. 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 in other jurisdictions that currently require (or will require in the future) the signature of lead audit partners on the audit report. Second, 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 consider that this is the case, given the quickly growing amount of evidence supporting the important role of audit partners as a determinant of audit quality. Third, 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 auditor. Therefore, nonpublic 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 individual auditors 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 results in some industries including too low a number of firms. These limitations need to be considered when interpreting the reported results.

ENDNOTES

[1] Another reason suggested by Bedard (2012) for replication studies is 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] Although they investigate the industry specialization of the audit firm, their results can be easily extended to the partner level.

[3] However, Hsieh and Lin (2015) provided an interesting alternative explanation to this finding, as they observed that industry partner-level specialists are less likely to accept clients with higher audit risk.

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

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

[6] For example, compared with less than 6 years in Taiwan (Chi & Chin, 2011).

[7] It is much higher than the 68% US (Audousset-Coulier et al., 2016) or the 64% Australian (Carey & Simnett, 2006) market shares.

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

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