Is there a gender effect on the quality of audit services?

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ABSTRACT

Should we expect a gender effect on the quality of audit services? Both the behavioural economics literature and the glass ceiling for women in the audit profession suggest an affirmative answer to this question. We conduct the study with a sample of Spanish-listed companies for the period between 2008 and 2015 and use the quality of the client's financial statements as a proxy for the quality of audit services. The results provide sound and consistent support for a positive female auditor effect on the quality of audit services. Although our figures suggest that men and women tend to audit different types of clients, the results are not driven by these differences. Moreover, the gender effect occurs from the very first year of the appointment of a female partner to replace a male auditor. This study may contribute to challenging stereotypes and may be informative for the ongoing political debate regarding the under-representation of women in senior management levels.

1. Introduction

The term gender, in the psychology and sociology fields, refers to the efforts of feminists to distinguish between the biological differences between men and women and the differences that are determined by social and cultural forces (Welsh, 1992). Hence, while sex differences suggest the existence of stable intrinsic traits for men and women, the concept of gender explains the effects of social norms on the differential perceptions between them (Unger, 1990; Welsh, 1992). In the guest editorial to an accounting and gender special issue, Broadbent and Kirkham (2008, p. 465) make the following controversial statement: "(….) though the World has, for some women, changed much over the last 30 years, it has, in some ways, stayed the same, and- for that reason the issue of gender remains just as relevant as it was then". While it is true that recent decades have observed the entry of women into the accounting profession in substantial numbers and that accounting firms have implemented targeted policies towards supporting women, the top ranks of the accounting profession remain resolutely gendered, showing a clear underrepresentation of women at senior levels (Broadbent & Kirkham, 2008). This situation occurs not only in the accounting profession, as the ongoing political debate within the European Union concerning the under-representation of women in firm management positions demonstrates (Khlif & Achek, 2017).

Auditors play a fundamental role in the classical corporate governance scheme in guaranteeing the quality of financial statements.

Following the Enron scandal, regulators and policy makers became particularly concerned about the quality of audit services (i.e., the Sarbanes-Oxley Act and, more recently, the Directive 2014/56/EU on audit quality). We investigate whether there exists a gender effect on the quality of audit services. Such an effect could exist, as the psychology and behavioural economics literature generally supports that men and women tend to behave differently (e.g., Costa, Terracciano, & McCrae, 2001; Croson & Gneezy, 2009; Feingold, 1994; Nettle, 2007; Schmitt, Realo, Voracek, & Allik, 2008). The investigation of gender differences in risk aversion is particularly meaningful for this study. In a review article, Charness and Gneezy (2012) conclude that women are more risk averse than men. This conclusion has potentially serious implications for the job market, mainly in financial and accounting fields, where risk aversion is a fundamental issue. According to Ittonen, Vähämaa, and Vähämaa (2013), gender-based differences in cognitive information-processing, diligence, conservatism, overconfidence and risk tolerance may impact auditor judgements, and consequently, the final quality of audit services. Using a sample of Swedish and Finnish companies, the researchers investigate the association between the gender of the auditor and the quality of the financial reports of clients and conclude that companies with female auditors tend to have higher financial reporting quality.

The research question of this study states: Do female auditors provide higher-quality audit services than do male auditors? We conduct the empirical analysis with a sample of Spanish listed companies for the

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research period between 2008 and 2015. Similar to prior related studies (Ittonen et al., 2013; Niskanen, Karjalainen, Niskanen, & Karjalainen, 2011), we use the quality of the financial statements of the auditor's client (as measured by discretionary accruals), as a proxy for the quality of audit services. According to the discussion in the former paragraph, the audit sector provides an ideal setting in which to observe a gender effect on the quality of the services provided. However, thus far, the scarce available evidence is limited to the Scandinavian region and has not provided sound and conclusive results. Therefore, we extend and refine the work of Ittonen et al. (2013) for Scandinavia to the Spanish audit market. Both the implications of the issue on various fields (i.e., gender studies, accounting and audit), and the limited available research make this study timely and potentially interesting. Additionally, it should be noted that, because of the importance of the institutional context for the level of accountability of auditors (Bedard, 2012), the results of single country studies cannot be generalized. In our specific case, this assertion is stressed by the clear country (or region) component of gender issues. As an example, an important finding supporting the idea that firms with female auditors would likely manipulate the financial statements less is that women appear to be more ethical than men (Ruegger & King, 1992). However, Chen, Velasquez Tuliao, Cullen, and Chang (2016) argue that gender differences in ethics are more pronounced under the cultural dimension of gender egalitarianism. Accordingly, as the Scandinavian region is regarded as more gender egalitarian than Spain, we may observe that companies with female auditors manipulate financial statements less in Scandinavia, whereas the situation is not necessarily the same in Spain. Therefore, we intend to contribute to the literature by providing the first study on the relationship between auditor gender and financial reporting quality outside the Scandinavian region. We also strive to contribute to the ongoing political debate regarding the under-representation of women in management positions in firms, providing updated evidence on the situation in Spain and its evolution during the last decade, and more importantly, on the implications of this situation for the quality of audit services. Moreover, in contrast to prior related studies, we control for the different types of firms that men and women generally audit, as well as analyse the impact of the substitution of a male auditor for a female auditor on financial reporting quality.

Our results provide sound and consistent support for a gender effect on the quality of audit services in Spain. Specifically, we find that female auditors are positively and significantly associated with higher financial reporting quality. This result appears robust and consistent across a variety of additional analyses and checks and, in particular, for the observation that men and women generally audit different types of firms. We also observe that the positive gender effect on the quality of audit services occurs from the very first year of the appointment of a woman to replace a male auditor. According to Dambrin and Lambert (2012), the lack of women in the higher ranks of the accounting profession suggests that, until stereotypes are challenged, gender inequality will remain. The researchers link the need for critical and reflective research on gender with an ongoing struggle to improve the position of women's representation in the accounting profession (Haynes, 2017). The results reported here intend to contribute to this goal.

The remainder of the paper is organized as follows. Section two outlines a review of the literature and develops our hypothesis. In section three, we present the design of the empirical research, followed by the discussion of the results in section four. Finally, in the last section, we derive the conclusions and limitations of our research, as well as the implications of the findings.

2. Background and hypothesis development

To answer the research question of this study, first, we examine the personal characteristics and skills that are perceived as the most important in the audit profession and infer potential gender differences in these skills. Thereafter, we discuss how the existence of a glass ceiling for women auditors may also provide sound arguments to support our hypothesis. Finally, we discuss the evidence reported by related studies.

2.1. Gender differences in skills for the accounting profession

Accounting conservatism, which is defined "as the accountant's tendency to require a higher degree of verification to recognize good news as gains than to recognize bad news as losses" (Basu, 1997, p. 7), has significantly influenced the accounting profession for a while. In accordance with Watts (2003), the available evidence supports that conservatism benefits financial reporting quality, at least from the perspective of the users of financial reports. Moreover, in countries such as Spain, which requires the signature of the auditor in the audit report, auditors are personally accountable for the audit report. Accordingly, more conservative auditors are expected to be more committed to financial reporting quality. The overconfidence of auditors may also affect audit quality (e.g., Messier, Owhoso, & Rakovski, 2008; Owhoso & Weickgenannt, 2009). According to Owhoso & Weickgenannt (2009, p. 17), "an overconfident auditor may fail to properly gauge the effectiveness of a client's systems and procedures, believing that he or she has the capacity to discover whatever weaknesses the client may have." As information-processing is intrinsically related to the auditing task (e.g., Brown & Solomon, 1991; Maletta & Kida, 1993), auditors with stronger information-processing skills are likely to provide higher-quality audit services. Finally, it should be noted that the audit profession plays a social trust function by representing a mechanism for holding managers accountable for their actions (Jensen, 2006). Therefore, auditors confront a serious conflict of interest as they owe a professional duty to the company stockholders and to society in general, although their remuneration is determined by the managers of the audited companies (Citron & Taffler, 2001). In sum, conservatism, information-processing skills and ethical behaviour should positively impact the quality of audit services, while overconfidence should have a negative impact.

Behavioural research has generally shown gender differences in the skills previously discussed. For conservatism, Byrnes, Miller, and Schafer's (1999) meta-analysis on 150 studies shows that women are, in general, more conservative than men. In this regard, focusing specifically on financial risk, there appears to be a consensus regarding the following: 1) women are more risk averse than men (e.g., Charness & Gneezy, 2012; Jianakoplos & Bernasek, 1998; Sunden & Surette, 1998); 2) men are more overconfident than women (e.g., Bengtsson, Persson, & Willenhag, 2005; Levin, Snyder, & Chapman, 1988; Lundeberg, Fox, & Puncochar, 1994); and 3) women possess stronger information-processing skills than men (e.g., Chung & Monroe, 2001; Darley & Smith, 1995). Regarding this latter issue, O'Donnell and Johnson (2001) conclude that female auditors demonstrate significantly greater efficiency than men in complex analytical procedures tasks. Finally, although there is no agreement on gender differences in ethical behaviour, certain studies show that women tend to be more ethical than men in the perception of business ethical situations (Ruegger & King, 1992) and less willing to engage in unethical behaviour in the workplace to obtain financial rewards (Betz, O'Connell, & Shepard, 1989). Focusing specifically on the audit profession, Bernardi and Arnold (1997) conclude that female auditors are at a significantly higher average level of moral development than are male auditors. However, evidence reported by other studies is not as conclusive (Roxas & Stoneback, 2004).

2.2. Barriers to entry and glass ceiling

Although women appear to possess strong skills for the audit profession, barriers to entry have led to the under-representation of women at senior levels of audit firms. As proffered by Haynes (2017), the incorporation of women into the accounting profession occurred over many decades of struggle. Kirkham and Loft (1993) stress the gender

hierarchy of accountancy dominated by men when they claim that the masculine qualities required contrasted markedly with the image of women as being weak, dependent and emotional. After acknowledging advancements in recent decades in accountancy and other service professions, Empson, Muzio, Broschak, and Hinings (2015) note that barriers to real advancement remain important. The changing gender balance has not been straightforward, and quantitative changes in the numbers of women have not been accompanied by gender transformation in the hierarchy of the profession (Ciancanelli, Gallhofer, Humphrey, & Kirkham, 1990; Haynes, 2017). According to Anderson-Gough, Grey, & Robson (2005), women confront stronger difficulties to attain leading positions in the audit profession because the evaluation of career promotion opportunities does not only involve technical and managerial skills but also the integration into informal and formal organizational processes that systematically disadvantage female auditors with family commitments. Similarly, Guillaume and Pochic (2009) argue that promotion criteria generally involve disadvantages for women. Finally, Haynes (2017) summarizes the main areas in which important challenges remain: gendered career hierarchies (Broadbent & Kirkham, 2008; Dambrin & Lambert, 2012), interaction with motherhood (Dambrin & Lambert, 2012; Haynes, 2008), work-life issues and choices (Anderson-Gough et al., 2005; Ladva & Andrew, 2014), and feminisation and segmentation in the profession (Almer, Lightbody, & Single, 2012; Khalifa, 2013; Lupu, 2012).

2.3. Results of related empirical studies

Likely because most countries do not require the signature of the auditor on the audit report, the available empirical evidence is very limited and focuses on the Scandinavian region. Using a sample of small and medium-size private Finnish firms, Niskanen et al. (2011) study the impact of auditor gender on discretionary accruals, a usual proxy for audit quality. As the authors acknowledge, their results were twofold. On the one hand, the authors observe that companies with female auditors show higher discretionary accruals in absolute values, thus suggesting more accounting manipulation and lower financial reporting quality. However, on the other hand, in the analysis conducted with separate sub-samples of income-increasing (earnings overstatements) and income-decreasing (earnings understatements) accruals, female auditors appear to be more conservative than men, which is an indicator of higher financial reporting quality. Subsequently, Ittonen et al. (2013) conduct a similar investigation on a sample of public Swedish and Finnish firms and observe a positive and significant direct relationship between having a female auditor and the quality of financial reports as measured by the absolute value of discretionary accruals. However, the evidence supporting this conclusion was not overly strong, as it was not consistent for both univariate and multivariate analyses or across different measures of discretionary accruals.

Other studies have addressed related issues that are also of interest for our research. Specifically, Menezes and Bras (2015) find evidence that a predominant presence of female certified public accountants in partnership positions in audit firms is positively associated with the quality of financial reports of the clients of the audit firm. Hardies, Breesch, and Branson (2015) observe that Belgian firms pay higher audit fees (by approximately 7%) to female auditors. This evidence may be interpreted in terms of audit quality (higher audit fees may indicate higher-quality audit services). However, there were also alternative explanations, as the hiring of a female auditor may be demand-driven without necessarily involving higher audit quality.[1] In addition for Belgium, Hardies, Breesch, and Branson (2016) observe that firms with female auditors have a higher likelihood of receiving a going-concern

modified opinion in the audit report. The authors interpret this result in terms of higher audit quality associated with female auditors.[2] Another related issue is how the presence of women on audit committees impacts financial reporting quality. The same reasons that support a gender effect on financial reporting quality may also explain higher financial reporting quality associated with the presence of female directors on the audit committee. Although the available evidence generally supports this view (e.g., Pucheta-Martinez, Bel-Oms, & Olcina-Sempere, 2016; Thiruvadi & Huang, 2011), Sun, Liu, and Lan (2011) are unable to identify any association between the proportion of female directors on audit committees and financial reporting quality. Finally, the available evidence generally supports that firms with female chief financial officers tend to show higher financial reporting quality (e.g., Barua, Davidson, Rama, & Thiruvadi, 2010; Francis, Hasan, Park, & Wu, 2015; Peni & Vähämaa, 2010).

2.4. Hypothesis

As we previously discussed in this section, women would appear to outperform men in the skills that are considered the most important for the audit profession. Moreover, a female auditor gender effect on the quality of audit work may also be expected due to the important barriers of entry in the audit profession, which means that female auditors in partnership positions must demonstrate extra competence (Ittonen et al., 2013). Accordingly, we should expect these female partners to provide, on average, higher-quality audit services than male auditors. Regarding the empirical evidence, prior related research provides support for a positive relationship between having a female auditor and financial reporting quality, and there is also evidence that both the presence of women on audit committees and in chief financial officer positions is associated with higher financial reporting quality. Therefore, we pose the hypothesis of this study as follows:

Hypothesis. Female auditors are positively and significantly associated with financial reporting quality.

3. Research design and sample selection

3.1. Research design

In accordance with prior related studies (Ittonen et al., 2013; Niskanen et al., 2011), we measure financial reporting quality with discretionary accruals, a usual indicator of accounting manipulation. Similar to these studies, we assume that high-quality auditors should lead to high financial reporting quality by reducing the client's use of discretionary accruals for accounting manipulation purposes. To estimate discretionary accruals, we utilize the approach proposed by Francis and Wang (2008). Accordingly, we first calculate total accruals as operating net income minus cash flows from operations scaled by lagged total assets. Then, we define discretionary accruals as total accruals in year *t* minus predicted accruals for year *t* as defined below. Similar to Francis and Wang (2008), we prefer this measure of accruals over the Jones-type models (Dechow, Sloan, & Sweeney, 1995, Jones, 1991, Kothari, Leone, & Wasley, 2005) due to the generally low number of observations per year, industry and country in our sample.[3]

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[1] For example, given that women are generally found to be more agreeable, tenderminded, warm and open to feelings, female auditors may be associated with higher client satisfaction (Hardies et al., 2015, p. 174).

[2] The higher propensity to issue going-concern opinions would indicate that female auditors are more independent.

[3] The standard approach in the literature is to conduct separate cross-section estimations of Jones (1991) type models at the industry level. However, as Francis and Wang (2008) note, this approach may not be feasible in many country-studies because of the low number of firms in certain industries.

Predicted accruals=$\{$[sales$_t$ × (current accruals$_{t-1}$/sales$_{t-1}$)]

$\qquad$ − [gross PPE_t × (depreciation$_{t-1}$/gross PPE_{t-1})]$\}$

/total assets$_{t-1}$

$\quad$ where

Current accruals (change in non-cash working capital)=

$\qquad$ Δ [total current assets

$\qquad$ -cash and short-term investments

$\qquad$ -treasury stock shown as current assets]

$\qquad$ -Δ [total current liabilities

$\qquad$ -total amount of debt in current liabilities

$\qquad$ -proposed dividends]

gross PPE: grossproperty, plant and equipment.

After computing discretionary accruals, the next step is to decide which form of this variable (the absolute or the raw values) is the most appropriate measure of financial reporting quality. This issue is not minor, as occasionally results are inconsistent across different definitions of accruals (e.g., Niskanen et al., 2011). To report robust results, we use both measures of discretionary accruals, as well as income-increasing and income-decreasing discretionary accruals. However, the main analysis is conducted with the raw value of discretionary accruals.[4]

As a preliminary step, we conduct a univariate analysis of the mean and median differences of discretionary accruals by auditor gender. Subsequently, for the multivariate analysis, we estimate the model given by Eq. (1) below, which includes discretionary accruals (*ACCRUALS*) as the dependent variable, our variable of interest *FEMALE* indicating auditor gender, as well as the usual control variables (Francis & Wang, 2008).

$$ACCRUALS_{i,t} = \beta_0 + \beta_1\, FEMALE_{i,t} + \beta_2\, BIG4_{i,t} + \beta_3\, LSALES_{i,t} + \beta_4\, CFO_{i,t}$$
$$+ \beta_5\, LEV_{i,t} + \beta_6\, LAG\_LOSS_{i,t} + \beta_7\, GROWTH_{i,t}$$
$$+ \beta_8\, \Delta PPE_{i,t} + fixed\ effects_{i,t} + \epsilon_{i,t} \qquad (1)$$

Dependent variable:

$\quad$ *ACCRUALS* (discretionary accruals). Defined as the raw value of discretionary accruals (*DA*) in the main model. The absolute value (*ABSDA*), as well as income-increasing (*IIDA*) and income-decreasing (*IDDA*) accruals are also used as dependent variables for additional analyses.

Variable of interest:

$\quad$ *FEMALE* (female auditor). A dummy variable that takes the value of 1 when the firm has a female auditor, and 0 otherwise.

Controls:

$\quad$ *BIG4* (type of audit firm). A dummy variable that takes the value of 1 if the auditor belongs to a Big 4 audit firm, and 0 otherwise;

$\quad$ *LSALES* (client's sales). The log of the client's sales in millions of €;

$\quad$ *CFO* (cash-flow from operations). Operating cash flows of the client scaled by lagged total assets;

$\quad$ *LEV* (leverage). The client's financial leverage measured as total liabilities divided by total assets;

$\quad$ *LAG_LOSS* (lagged losses). A dummy variable that takes the value of 1 if the client reports negative income before extraordinary items in year $t − 1$, and 0 otherwise;

GROWTH (sales growth). Sales in year t minus sales in $t − 1$ and scaled by sales in year $t − 1$; and

Δ*PPE* (growth rate of gross property plant and equipment). Gross PPE in year t minus gross PPE in $t − 1$ and scaled by gross PPE in $t − 1$.

Year and industry dummy variables are also included as fixed effects.

According to the hypothesis of this study, we predict a negative and significant coefficient for our variable of interest, *FEMALE*. This prediction would indicate that female auditors are associated with lower levels of discretionary accruals and, thus, with higher financial reporting quality.

Next, we briefly discuss the control variables in our model in similar terms as Francis and Wang (2008). We include *BIG4* because prior studies generally show that large audit firms provide higher quality services (e.g., Becker, DeFond, Jiambalvo, & Subramanyam, 1998; Francis, Maydew, & Sparks, 1999). According to Francis and Wang (2008), large firms (*LSALES*) show lower levels of accruals than smaller firms, including after scaling accruals by firm size. With *CFO*, we intend to control for a well-documented inverse relationship between operating cash flows and accruals (Dechow, 1994). We include *LEV*, as highly leveraged firms have stronger incentives to manipulate earnings to avoid debt covenant violations (Becker et al., 1998). The reporting of losses (*LAG_LOSS*) constitutes an indicator of poor financial health, and according to DeAngelo, DeAngelo, and Skinner (1994), troubled companies confront strong incentives to manipulate earnings. Finally, as Francis and Wang (2008), we include *GROWTH* and Δ*PPE* to control for the growth and property and the plant and equipment of firms, which are two recognized drivers of accruals.

3.2. Sample selection

We conduct the empirical analysis on a sample of non-financial companies[5] listed on the Spanish Stock Exchange (*Sistema de Interconexión Bursátil Español*) for the period between 2008 and 2015. Information regarding our variable of interest (*FEMALE*) is hand collected from financial reports available at the National Securities Market Commission (*Comisión Nacional del Mercado de Valores* - CNMV) website. Data for control variables are obtained from Capital IQ. Our sample consists of 91 firms and, given the eight-year research period, 728 firm-year observations. However, due to lack of data for seven firm-year observations, the final sample consists of 721 firm-year observations.

Table 1 summarizes the presence of female audit partners in Spain during the research period. As it can be observed, firms with female auditors only represent 10% of the total sample. This percentage is slightly lower than in Ittonen et al. (2013) (11%). However, it should be noted that the research period in Ittonen et al. (2013) was 2005–2007. For 2008, the first year of our research period, the presence of women in our sample is only 5%.[6] Thus, a first conclusion is that the presence of female audit partners in Spain is lower (or at least was lower in the past) than in the Scandinavian region. A second interesting figure is that the number of audit reports signed by women has tripled during the research period, meaning an average annual rate of growth of 17%. Finally, the presence of women is not homogeneously distributed across industries; for instance, "financial services and real estate", "technology and telecommunications" and "consumer services" are the industries with the highest percentage of female auditors, whereas "petrol and power" and "basic materials, industry and construction" are the industries with the lowest percentage. These figures indicate that men

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[4] Similar to Francis and Wang (2008), we base our decision on the fact that the use of the absolute value of discretionary accruals does not allow one to control for the different implications of earnings overstatements and earnings understatements. The limitations of absolute discretionary accruals as a reliable measure of financial reporting quality are clearly illustrated by the fact that, although Niskanen et al. (2011) found a positive and significant relationship between having a female auditor and absolute discretionary accruals and Ittonen et al. (2013) reported a negative and significant relationship, both authors derived the same conclusion; firms with female auditors had higher financial reporting quality.

[5] As is usual in the audit literature, we exclude financial companies because we use financial ratios as control variables in Eq. (1).

[6] We do not compare our figures with Niskanen et al. (2011) or Hardies et al. (2016) because both papers use samples of private firms.

Table 1

Number of audit reports per year and industry. In parentheses, the number of audit reports signed by female auditors.

	2008	2009	2010	2011	2012	2013	2014	2015	Total
Petrol and power	8 (0)	8 (0)	8 (0)	8 (0)	8 (0)	8 (1)	8 (2)	8 (1)	64 (4)
Basic materials, industry and construction	29 (1)	28 (0)	28 (0)	28 (2)	29 (3)	29 (3)	29 (3)	29 (3)	229 (15)
Consumer goods	23 (1)	23 (1)	23 (2)	23 (2)	23 (3)	23 (3)	22 (3)	22 (3)	182 (18)
Consumer services	14 (2)	14 (2)	14 (2)	14 (2)	14 (2)	14 (2)	13 (1)	13 (3)	110 (16)
Financial services and real estate	11 (1)	11 (2)	11 (1)	11 (1)	11 (1)	11 (1)	11 (3)	11 (3)	88 (13)
Technology and telecommunications	6 (0)	6 (0)	6 (0)	6 (0)	6 (1)	6 (2)	6 (2)	6 (2)	48 (7)
Total	91 (5)	90 (5)	90 (5)	90 (7)	91 (10)	91 (12)	89 (14)	89 (15)	721 (73)

Table 2

Descriptive statistics for our sample.

Variable	Mean	Median	Standard dev.	Maximum	Minimum
FEMALE	0.10	0.00	0.30	1.00	0.00
BIG4	0.94	1.00	0.23	1.00	0.00
LSALES	2.77	2.80	0.88	4.92	0.18
CFO	0.07	0.06	0.08	0.50	−0.34
LEV	0.74	0.67	1.03	21.17	0.10
LAG_LOSS	0.28	0.00	0.45	1.00	0.00
GROWTH	0.02	0.00	0.45	6.82	−0.94
ΔPPE	0.04	−0.02	0.95	20.71	−2.34

Variables: *FEMALE* (female auditor); *BIG4* (type of audit firm); *LSALES* (client's sales); *CFO* (cash-flow from operations); *LEV* (leverage); *LAG_LOSS* (lagged losses); *GROWTH* (sales growth); and *ΔPPE* (growth rate of gross property plant and equipment).

and women tend to audit different types of firms and show industry specialization of auditors by gender.

Table 2 provides descriptive statistics for our sample. The most interesting feature is the extreme concentration of the Spanish audit market by Big 4 audit firms, representing 94% of the market for listed companies. This percentage is slightly above the 90% value in Ittonen et al. (2013).

Table 3 provides Pearson correlation coefficients with significance levels. We are particularly interested in the correlation patterns of our gender variable *FEMALE* with discretionary accruals. The most remarkable result is the negative and significant correlation between both variables, suggesting that firms with female auditors show lower discretionary accruals and, thus, higher financial reporting quality. Another interesting feature is the negative and significant correlation between having a female auditor and client's sales, indicating that women tend to audit smaller firms. Regarding the dependent variable, Table 3 shows the expected correlation pattern of discretionary accruals with cash flows, leverage and losses. However, for the type of audit firm and *GROWTH*, the sign of the correlation is opposite to our expectations. Finally, given the relatively low correlation coefficients (maximum value is 0.32 for the correlation between sales and audit firm type), we do not expect serious multicollinearity problems in the dataset.

Table 4

Univariate analysis. Mean and median values of discretionary accruals for the subsamples of firms with male and with female auditors.

Variable	Mean		*p*-Value	Median		*p*-Value
	Female auditor	Male auditor		Female auditor	Male auditor	
DA	−0.068	−0.037	0.027	−0.048	−0.040	0.088
ABSDA	0.111	0.089	0.069	0.075	0.061	0.452
IIDA	0.082	0.083	0.959	0.035	0.048	0.638
IDDA	−0.111	−0.086	0.025	−0.076	−0.066	0.288

The *t*-test is used to assess statistical significance of mean accruals while the Mann-Whitney test is used for median accruals.
Variables: DA (raw value of discretionary accruals); *ABSDA* (absolute value of discretionary accruals); *IIDA* (income-increasing discretionary accruals); and *IDDA* (income-decreasing discretionary accruals).

4. Results and discussion

4.1. Results of the univariate analysis

We begin with a univariate analysis of the mean and median differences of discretionary accruals by auditor gender, the results displayed in Table 4. Although the main analysis is conducted with raw discretionary accruals (*DA*), we also provide information for the alternative definitions of accruals (*ABSDA*, *IIDA* and *IDDA*). We use a *t*-test to assess the statistical significance of the mean differences and the Mann-Whitney test for median differences. The figures indicate that firms with female auditors show significantly lower discretionary accruals; thus, they present higher financial reporting quality. The same result is observed with both the *t*-test and the Mann-Whitney test; although in the latter case, significance is reported only at marginal levels (*p*-value < 0.10). This result reinforces the negative correlation between *FEMALE* and *DA* observed in Table 3. Regarding the alternative definitions of accruals, significant differences in the means are also observed for income-decreasing discretionary accruals and for the absolute value of discretionary accruals. In sum, data displayed in Table 4 suggest that female auditors appear to show stronger accounting conservatism, as the firms they audit have lower income-decreasing

Table 3

Pearson correlations and levels of significance.

	DA	FEMALE	BIG4	LSALES	CFO	LEV	LAG_LOSS	GROWTH
FEMALE	−0.13***							
BIG4	0.10***	−0.04						
LSALES	−0.04	−0.07*	0.32***					
CFO	−0.25***	−0.02	0.11***	0.19***				
LEV	0.13***	−0.01	−0.15***	−0.13***	−0.11***			
LAG_LOSS	0.09**	0.09**	−0.18***	−0.25***	−0.30***	0.15***		
GROWTH	−0.31***	0.04	0.00	0.07*	0.15***	−0.08**	−0.05	
ΔPPE	−0.06	0.10***	−0.02	0.02	0.15***	−0.07*	−0.05	0.07*

*, **, ***Significant at 10%, 5% and 1% respectively.
Variables: *DA* (raw value of discretionary accruals); *FEMALE* (female auditor); *BIG4* (type of audit firm); *LSALES* (client's sales); *CFO* (cash-flow from operations); *LEV* (leverage); *LAG_LOSS* (lagged losses); *GROWTH* (sales growth); and *ΔPPE* (growth rate of gross property plant and equipment).

discretionary accruals eventually leading to lower raw discretionary accruals and larger absolute discretionary accruals.[7] Prior evidence reported by Ittonen et al. (2013) does not show significant differences in discretionary accruals by auditor gender.[8]

4.2. Results of the multivariate analysis

Table 5 shows the estimates of Eq. (1). The first column displays the results of the main analysis using raw discretionary accruals as a dependent variable, whereas the remaining columns show the results of the estimations with the alternative definitions of accruals. In accordance with the panel structure of our dataset, we use panel data techniques in all the estimations. As we detected heteroscedasticity and autocorrelation in the dataset, we apply the Prais-Wistein regression with heteroscedastic panels corrected errors for the estimation of the models with DA and ABSDA as the dependent variables. Regarding the models with IIDA and IDDA, the fact that both variables are censored at zero advocates the use of Tobit panel data regression (Greene, 2000). All four estimations are statistically significant at the usual levels (p-value < 0.01) with relatively high explanatory power.[9] Although the Pearson correlation coefficients displayed in Table 3 do not suggest multicollinearity problems, after the estimations, we calculate variance inflation factors (untabulated) to further assess potential multicollinearity problems. The low values of these factors (average value of 1.16 with a maximum of 1.27 for LAG_LOSS) support the view of no serious multicollinearity in our dataset.

The results of the main analysis (first column of Table 5) show a negative and significant coefficient for FEMALE. Accordingly, female auditors are associated with lower discretionary accruals and thus with higher financial reporting quality. This result supports our hypothesis of a positive female auditor effect on the quality of financial statements. The results for control variables generally meet expectations. Hence, with the only exception of the type of audit firm (marginally significant with a positive sign), whenever a significant effect is observed, it has the predicted sign. We report significant effects for cash flow and growth (p-value < 0.01) and marginally significant results for leverage (p-value < 0.1). Conversely, we report statistically insignificant results, at conventional levels, for sales, lagged losses and increase in property, plant and equipment.

Regarding the additional analyses, we observe positive and significant coefficient for FEMALE in the model with discretionary accruals in absolute values. This observation indicates that, when we ignore the sign of accruals, firms with female auditors show significantly higher levels of discretionary accruals. Prior research has provided conflicting results on the impact auditor gender on absolute discretionary accruals. In particular, while Niskanen et al. (2011) observe that female auditors are associated with higher accruals, Ittonen et al. (2013) conclude the opposite.[10] Therefore, although our study shows more similarities with Ittonen et al. (2013), the results are more in accordance with Niskanen et al. (2011). Our segmented analyses with income-increasing (IIDA) and income-decreasing (IDDA) accruals support that the higher levels of absolute discretionary accruals for firms with female auditors suggest that women are, in fact, more conservative than men. The coefficient of IIDA is negative and on the edge of being statistically significant at the 10% level. This finding suggests lower earnings overstatements

associated with female auditors. The results are clearer for IDDA, as FEMALE shows a negative and statistically significant coefficient (p-value < 0.05). This finding indicates that female auditors tend to be more conservative[11] than male auditors, and as accounting conservatism is positively regarded in the financial reporting literature (Watts, 2003), it suggests higher financial reporting quality. The results displayed in Table 5 stress the importance of considering the widest possible definition of discretionary accruals when this variable is used as a proxy for financial reporting quality. In sum, the results of the multivariate analysis are consistent with the preliminary univariate analysis displayed in Table 4.

To end this section, we investigate whether the positive association between female auditors and financial reporting quality may be explained by differences in the audit effort between male and female auditors. Hence, we collected the amount of audit fees for our sample of firms during the research period[12] and subsequently conducted a t-test and the Mann-Whitney test to seek significant gender differences in audit fees. The results of both tests, which are displayed in Table 6 (panel B), do not provide support for significant differences in audit fees due to the gender of the audit partner. Therefore, the relationship between auditor gender and financial reporting quality does not appear to be driven by gender differences in audit effort.

4.3. Robustness checks

In this subsection, we discuss the results of various checks conducted to assess the robustness of the main result of this study that female auditors provide higher-quality audit services.

First, we check for potential endogeneity problems in our estimations. The results of the Durbin–Wu–Hausman test (augmented regression test) do not suggest endogeneity problems in the estimations of Eq. (1) (results untabulated). Specifically, when we re-estimate the equation after including the residuals of the potentially endogenous variable (FEMALE) as a new independent variable in the model, the coefficient of the new variable is statistically insignificant (p-value = 0.861), while FEMALE remains significant with the same sign as in the original estimations.

Second, after the estimation of Eq. (1) with the definition of discretionary accruals provided by Francis and Wang (2008), we check the robustness of our results to other definitions of discretionary accruals. Hence, we re-estimate Eq. (1), first with the definition of discretionary accruals proposed by DeFond and Park (2001) and Carey and Simnett (2006), among others, which essentially captures abnormal working capital accruals[13] and thereafter, with discretionary accruals defined as in Kothari et al. (2005),[14] controlling for firm performance. Given the relatively low number of observations in certain industries, in the latter case, we conduct country-year estimations of the model. For the first definition of discretionary accruals, the results (untabulated) are very similar to those reported in Table 5. Conversely, when we use the definition of accruals used by Kothari et al. (2005), FEMALE shows

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[7] Female auditors are associated with lower income-decreasing discretionary accruals. As these accruals have negative sign, this result means stronger accounting conservatism, and thus, higher financial reporting quality.

[8] Ittonen et al. (2013) conduct only a t-test of the differences of the means and reported non-significant differences.

[9] 32% R-squared. In Niskanen et al. (2011) and Ittonen et al. (2013), pseudo R-square is 6% and 20%, respectively.

[10] It should be noted that Ittonen et al. (2013) reported significant results with one measure of discretionary accruals but insignificant results with the other measure.

[11] As income-decreasing accruals (IDDA) have a negative sign, lower levels of accruals mean higher earnings understatement adjustments and, thus, stronger accounting conservatism.

[12] This analysis was conducted with a subsample of 612 firm-year observations because, for 109 cases, we were not able to collect the amount of audit fees.

[13] AWCA (abnormal working capital accruals) are defined as: $AWCA_t = WC_t - [(WC_{t-1} / S_{t-1}) \times S_t]$, where WC and S denote non-cash working capital and sales, respectively.

[14] The model is similar to the Jones (1991) model; however, it also includes lagged return on assets. It is defined as: $TA_{it} = d_0/ ASSETS_{it-1} + d_1\Delta SALES_{it} + d_2PPE_{it} + d_3ROA_{it-1} + u_{it}$, where TA, $ASSETS$, $\Delta SALES$, PPE and ROA denote total accruals, total assets, increase in sales, property plant and equipment and return on assets, respectively. Discretionary accruals are captured by the error term of the model.

Table 5

Multivariate analysis. Results of the estimation of the model (*z*-values in parentheses). Main analysis with *DA* as the dependent variable. Additional analyses with *ABSDA*, *IIDA* and *IDDA* as the dependent variables.

Variable	Predicted sign	DA	ABSDA	IIDA	IDDA
FEMALE	−	−0.032	0.028	−0.042	−0.030
		(−3.13)***	(2.25)**	(−1.62)	(−2.41)**
BIG4	−	0.032	−0.061	0.006	0.037
		(1.82)*	(−1.99)**	(0.17)	(1.98)**
LSALES	−	0.005	−0.032	−0.027	0.015
		(1.31)	(−5.13)***	(−2.13)**	(2.52)**
CFO	−	−0.651	0.243	−0.834	−0.605
		(−9.98)***	(3.94)***	(−7.93)***	(−10.55)***
LEV	+	0.029	0.064	0.078	−0.000
		(1.80)*	(2.90)***	(2.78)***	(−0.00)
LAG_LOSS	+	0.001	−0.003	−0.008	−0.004
		(0.84)	(−0.41)	(−0.51)	(−0.46)
GROWTH	+	0.057	0.079	0.128	0.015
		(3.13)***	(4.36)***	(5.61)***	(1.07)
ΔPPE	+	−0.018	−0.008	−0.028	−0.012
		(−1.37)	(−0.61)	(−1.31)	(−1.09)
Industry effects		YES	YES	YES	YES
Year effects		YES	YES	YES	YES
Constant		−0.102	0.198	−0.095	−0.124
		(−4.29)***	(5.30)***	(−1.60)	(−4.16)***
# of observ.		721	721	203	518
R-sq.		0.32	0.32		
Wald-Chi sq.		223.46***	125.53***	122.96***	184.01***

*, **, ***Significant at 10%, 5% and 1% respectively.

Variables: *DA* (raw value of discretionary accruals); *ABSDA* (absolute value of discretionary accruals); *IIDA* (income-increasing discretionary accruals); *IDDA* (income-decreasing discretionary accruals); *FEMALE* (female auditor); *BIG4* (type of audit firm); *LSALES* (client's sales); *CFO* (cash-flow from operations); *LEV* (leverage); *LAG_LOSS* (lagged losses); *GROWTH* (sales growth); and *ΔPPE* (growth rate of gross property plant and equipment).

Table 6

Clients characteristics (panels A and C) and audit effort (panel B) by auditor gender.

Panel A: The "big baths" explanation	Female auditor	Male auditor	p-Value
% of clients with big losses	15	11	0.28
% of clients with big negative surprises	14	12	0.64

	Mean		p-Value	Median		p-Value
	Female auditor	Male auditor		Female auditor	Male auditor	
Panel B: Differences in audit effort						
Audit fees (in millions of €)	0.70	1.28	0.18	0.22	0.37	0.25
Panel C: Difference in client's characteristics						
CFO	0.06	0.07	0.67	0.04	0.06	0.31
LEV	0.70	0.68	0.66	0.67	0.66	0.84
Size (sales in millions of €)	932.86	4584.08	0.01	597.96	643.60	0.14
# of business segments	3.81	4.66	0.05	4.00	4.00	0.11

p-Values correspond to *Pearson Chi-squared* test in panel A, and *t*-test (means) and Mann-Whitney test (medians) in panels B and C.

negative and significant coefficients in all the new estimations with the only exception being the model with income-decreasing accruals ($\beta = -0.011$ with *p*-value < 0.05 in the model with *DA*; $\beta = -0.007$ with *p*-value < 0.10 in the model with *ABSDA*; $\beta = -0.019$ with *p*-value < 0.05 in the model with *IIDA*; and $\beta = -0.003$ with *p*-value = 0.77 in the model with *IDDA*). Therefore, the positive association between female auditors and financial reporting quality observed in Table 5 is robust across alternative definitions of discretionary accruals.

In the third check, we examine whether the positive association between female auditors and financial reporting quality may be driven by the observation that women could allow more "big baths" (one-time overstatement of expenses that would reduce future expenses) than male auditors. This allowance would be consistent with the results displayed in Table 5 in the models with *IIDA* (insignificant results for *FEMALE*) and *IDDA* (significant results with negative sign for *FEMALE*); however, the results obtained using the definition of discretionary

accruals used by Kothari et al. (2005) do not support that female auditors allow more big baths than male auditors. Under the "big baths" explanation, the interpretation that female auditors provide higher-quality audit services could be put into question, as "big baths" indicate lower financial reporting quality. To conduct this analysis, we define two new variables: *BIGLOSS* (big losses): 1 if net income divided by lagged total assets is lower than −10%, and 0 otherwise; and *BIGNEGSURP* (big negative surprise): 1 if the reported net income was < 75% the expected net income by the consensus of analysts, and 0 otherwise.[15] Thereafter, we apply the *Pearson chi-squared* test to assess whether gender differences in both variables are significant. The results of the test displayed in Table 6 (panel A) do not suggest that female auditors allow more "big baths" than male auditors, as we do not

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[15] We choose these cut-off points based on the distribution of both variables in our sample. However, we checked for the −5% and 50% thresholds for *BIGLOSS* and *BIGNEGSURP*, respectively, and results do not change.

observe significant differences in either *BIGLOSS* or *BIGNEGSURP* by auditor gender. Therefore, it does not appear that our results supporting female association with higher financial reporting quality would be biased by female propensity for "big baths" practices.

The last check addresses whether the higher financial reporting quality observed for firms with female auditors may be driven by the observation that, as women appear to be more risk-adverse than men (e.g., Charness & Gneezy, 2012; Jianakoplos & Bernasek, 1998; Sunden & Surette, 1998), they may tend to audit those companies with lower levels of risk. Although Eq. (1) currently controls for client riskiness, and the results of the endogeneity test previously discussed do not suggest this to be the case, we further check for this possibility. Accordingly, we choose cash-flows from operations (*CFO*) and financial leverage (*LEV*) as the proxies for client's riskiness; we then apply both a *t*-test and the Mann-Whitney test for assessing differences in client riskiness by auditor gender. As shown by Table 6 (panel C), both tests agree that there are no significant gender differences in either *CFO* or *LEV*. Therefore, we should discard the explanation that the association between auditor gender and the quality of audit services is driven by differences in client riskiness.

4.4. Additional analysis (I): financial reporting quality measured by accounting restatements

This analysis addresses whether the auditor gender effect on financial reporting quality holds for a different proxy of financial reporting quality. This analysis is motivated by the observation that, as DeFond and Zhang (2014) note, measuring audit quality is a challenging task, and all the proposed proxies (including discretionary accruals) present one limitation or another. The issuance of modified audit opinions to those clients who deserve it and accounting restatements are other usual proxies in the accounting and auditing literature (DeFond & Zhang, 2014). In the latter case, the restatement of accounting statements is interpreted as an indicator of lack of financial reporting quality. Due to the very low number of modified opinions in our sample, which is insufficient for conducting a sound analysis based on this variable, we choose accounting restatements as the additional proxy for financial reporting quality. Accordingly, we propose the model given by Eq. (2) below:

$$RESTATE_{i,t} = \beta_0 + \beta_1\, FEMALE_{i,t} + \beta_2\, BIG4_{i,t} + \beta_3\, LSALES_{i,t} + \beta_4\, AGE +$$
$$+ \beta_5\, CFO_{i,t} + \beta_6\, LEV_{i,t} + \beta_7\, LAG\_LOSS_{i,t} + fixed\ effects_{i,t}$$
$$+ \epsilon_{i,t}$$
(2)

The dependent variable *RESTATE* is defined as 1 if the accounting statements of year *t* are later restated, and 0 otherwise.[16] The frequency of restatements in our sample (20%) is in accordance with prior studies for the US (e.g., 17.6% in Paterson & Valencia, 2011 and 16% in Blay & Geiger, 2013). The variable of interest (*FEMALE*) is the same as in Eq. (1), and we include the usual control variables for restatements (e.g., Kinney, Palmrose, & Scholz, 2004; Paterson & Valencia, 2011). According to the hypothesis of this study, we expect a positive relationship between having a female auditor and financial reporting quality and, therefore, a negative relationship with the likelihood of restatements. Table 7 displays the estimates of the logistic model represented by Eq. (2). The most interesting result in the Table is the negative and significant coefficient of *FEMALE* (*p*-value < 0.05), indicating that, as predicted, firms with female auditors show lower likelihood of accounting restatements. Accordingly, the main conclusion from Table 5 that female auditors are associated with higher financial reporting

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[16] Restatements (categorized as "RS" in the Capital IQ database) involve any situation in which net income or cash from operations are fundamentally different from originally reported.

Table 7
Results of the estimation of the logistic model with accounting restatements (*RESTATE*) as the dependent variable (z-values in parentheses).

Variable	Predicted sign	*RESTATE*
FEMALE	−	−0.869
		(−2.20)**
BIG4	−	−2.116
		(−5.18)***
LSALES	+/−	0.394
		(2.83)***
AGE	−	0.024
		(1.47)
CFO	−	−2.429
		(−1.73)*
LEV	+	0.078
		(0.19)
LAG_LOSS	+	0.136
		(0.56)
Industry effects		YES
Year effects		YES
Constant		−0.128
		(−0.18)
# of observ.		721
R-sq.		0.122
Wald-Chi sq.		92.63***

*, **, ***Significant at 10%, 5% and 1% respectively.
Variables: *RESTATE* (accounting restatements); *FEMALE* (female auditor); *BIG4* (type of audit firm); *LSALES* (client's sales); *AGE* (client's age); *CFO* (cash-flow from operations); *LEV* (leverage); and *LAG_LOSS* (lagged losses).

quality holds when financial reporting quality is proxied by accounting restatements.

4.5. Additional analysis (II): analysis with a matched sample

Results in Tables 3, 4, 5 and 7 indicate a positive association between female auditors and the quality of audit services. While the battery of robustness checks conducted thus far makes us conclude that this result is sound, we want to explore more in depth whether this result may be driven by differences in the types of clients generally audited by men and women. The glass ceiling for women in the audit profession provides justification for this analysis, as the stronger difficulties of female auditors to attain the top of the hierarchy in the audit firms (Anderson-Gough et al., 2005; Dambrin & Lambert, 2012) suggest that they likely audit the smallest and less complex clients, usually involving lower audit difficulties. To control for this issue, we first need to assess whether male and female partners do in fact audit different types of clients. Table 6 (panel C) displays the mean and median values of sales and number of business segments (proxies for size and complexity, respectively) for firms by auditor gender. The Table 6 also provides the results of both a *t*-test and the Mann-Whitney test to assess the statistical significance of these differences. While the *t*-test results support that women generally audit smaller and less complex firms, the Mann-Whitney test provides statistically insignificant results. Moreover, Table 1 shows that the presence of female auditors is not homogeneously distributed across industries (i.e., women being openly underrepresented in "petrol and power" and in "basic materials, industry and construction"). Therefore, according to the figures in Tables 1 and 6, it appears convenient to check whether the gender effect observed in this study thus far is driven by the different types of firms that men and women generally audit.

Accordingly, we re-estimate the model with a matched sample to control for the facts that: 1) women generally audit smaller and less complex firms, and 2) their clients are not homogeneously distributed across industries. The standard technique for constructing a matched sample with a panel dataset is to match each firm with a female auditor in year *t* with a similar firm (in terms of industry, size and number of business segments) with a male auditor the same year. However,

because of the low presence of female auditors in our sample, we utilize an alternative approach that ignores the time dimension in the matching procedure; thus, we match each firm with a female auditor with a similar firm (same industry, similar size and same number of business segments) with a male auditor, resulting in a final sample of 349 firm-year observations.[17] Once created, it is necessary to check whether the new sample adequately controls for the different types of clients of male and female auditors. Both the *t*-test and the Mann–Whitney test (untabulated) results show insignificant differences in client's size or complexity by auditor gender in the new sample. Similarly, the Kruskal–Wallis test (untabulated) shows insignificant differences in the industry distribution of clients by auditor gender. Therefore, we should conclude that the matched sample effectively controls for these issues.

Table 8 shows the results of the new set of estimations of Eq. (1) with the matched sample. All four estimations are statistically significant at the usual levels (*p*-value < 0.01), with similar explanatory power as the estimations based on the whole sample. However, because of the smaller size of the matched sample, the results in Table 8 are not as reliable as those displayed in Table 5. Thus, the main result is the negative and significant coefficient of *FEMALE* in the main model with raw discretionary accruals (*DA*) as the dependent variable. As in Table 5, this result indicates that female auditors are associated with lower discretionary accruals, and thus with higher financial reporting quality. This result reinforces our previous findings with the whole sample and indicates that results in Table 5 were not driven by differences in the types of firms than men and women generally audit. In contrast to Table 5, we do not observe significant results for *FEMALE* in any of the additional estimations. Nevertheless, the sign of the coefficients is always the same as in Table 5, and in the estimations with accruals in absolute values and, particularly with income-decreasing accruals (the estimations which show significant results for *FEMALE* in Table 5), the results are on the edge of significance at the 10% level.

4.6. Additional analysis (III): the substitution of a male auditor for a female auditor

In the last analysis of this study, we investigate whether the appointment of a female auditor to replace a male auditor has any significant impact on financial reporting quality. According to our hypothesis and the results reported thus far, we should expect a positive impact. Hence, we re-estimate Eq. (1) with two new variables of interest: *MALE-FEMALE* (1 if a female auditor substitutes a male auditor, and 0 otherwise) and *MALE-MALE* (1 if a male auditor substitutes another male auditor, and 0 otherwise), instead of the original variable *FEMALE*.[18] Table 9 presents the new set of estimates, which are strongly consistent with the figures displayed in Table 5. Hence, the new variable *MALE-FEMALE* has a negative and significant coefficient in the main model, indicating that the substitution of a male auditor for a female auditor is associated with lower raw discretionary accruals (higher financial reporting quality). Moreover, as in Table 5, we report a positive and statistically significant coefficient in the model with accruals in absolute values and a negative and significant coefficient in the model with income-decreasing accruals. Nevertheless, while in Table 5, the impact of *FEMALE* on income-increasing accruals was on the edge of marginal significance, the results for *MALE-FEMALE* in

Table 9 become significant (*p*-value < 0.05) with the predicted negative sign. This finding indicates that the substitution of a male auditor for a female auditor is associated with less overstatement of earnings, providing further support against the "big baths" explanation previously discussed.

Conversely, *MALE-MALE* presents statistically insignificant coefficients in all the estimations. Hence, in contrast to what occurs when a woman substitutes for a man as the auditor of the firm, the replacement of a male auditor for another male auditor involves no significant effect on discretionary accruals, and this holds independently of how discretionary accruals are defined. Therefore, we should conclude that while the appointment of a female auditor to replace a male auditor appears to be associated with higher-quality audit services, the change of a male auditor for another male auditor does not. However, it should be noted that, because of the low number of male-female auditor changes in our sample (only 20), the results of these estimations need to be carefully considered.

5. Conclusions, implications ad limitations

Women are clearly underrepresented in the top ranks of audit firms. This situation, which occurs not only in the accounting profession but also in other areas of management, has motivated intense academic and political debates on its causes and, more importantly, on the possible solutions. In the specific case of Spain, our figures show that although the audit reports signed by women have tripled during our eight-year research period, at the end of 2015, they continued to represent < 20% of total reports. Such an unbalanced situation, although far from surprising, appears particularly undesirable in the audit profession, as the behavioural economics literature suggests that women possess strong advantages in some of the skills that are considered the most important for the audit profession. Our results indicate the existence of a gender effect on the quality of audit services, as having a female auditor is associated with significantly higher levels of financial reporting quality. To minimize the risk of reporting purely spurious results, we have conducted a variety of robustness checks.

The evidence reported here extends and reinforces prior related research for the Scandinavian region, where the presence of women in the senior levels of audit firms began earlier than in Spain. Our figures also indicate that the presence of female auditors is much higher in certain industries (real estate, financial and consumer services) than in others (petrol and power and basic materials, industry and construction). We also observe that women tend to audit relatively smaller and less complex firms. Therefore, we have controlled for potential endogeneity problems, which may cause the positive female auditor effect observed here to be driven by the different types of firms audited by men and women. Nevertheless, the results obtained with a matched sample, which intends to control for this issue, do not suggest this assertion to be the case. Furthermore, the results show that the positive female auditor impact on financial reporting quality occurs since the very first year of the appointment of a female partner to replace a male auditor.

These results openly support the claim of Jeacle (2011) that the female gender, often viewed as a negative characteristic to achieving career success within the discriminatory environment of the accounting firm, may generally act as a positive attribute in business. Similarly, Dambrin and Lambert (2012) argue the need to perform critical and reflective research on gender to improve the position of women's representation in the accounting profession since, until stereotypes are challenged, gender inequality will remain. This study may contribute to the challenging of these stereotypes and may be informative for the ongoing political debate regarding the under-representation of women in the senior levels of the accounting and audit profession.

Like prior related studies, the main limitation of this study is due to the low presence of female auditors in our sample, which may make our results sensitive to the particular characteristics of these relatively few

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[17] The standard matching procedure would have involved the loss of approximately 80% of the dataset. The fact that our initial sample was not overly large precludes us from utilising this approach.

[18] To conduct these new estimations, we removed from the sample seven observations corresponding to substitutions of female auditors for male auditors and one observation corresponding to a substitution of a female auditor for another female auditor. Because of the low number of cases, we have not included the corresponding *FEMALE-FEMALE* or *FEMALE-MALE* variables in the new estimations.

Table 8

Results of the estimations with a matched sample (*z*-values in parentheses). Main analysis with *DA* as the dependent variable. Additional analyses with *ABSDA*, *IIDA* and *IDDA* as the dependent variables.

Variable	Predicted sign	DA	ABSDA	IIDA	IDDA
FEMALE	−	−0.034	0.018	−0.037	−0.022
		(−2.37)**	(1.33)	(−0.99)	(−1.53)
BIG4	−	0.061	−0.073	0.045	0.069
		(1.45)	(−1.95)*	(0.72)	(2.75)***
LSALES	−	0.002	−0.051	−0.037	0.019
		(0.24)	(−4.77)***	(−1.32)	(1.91)*
CFO	−	−0.772	0.173	−1.353	−0.690
		(−7.29)***	(1.94)*	(−7.27)***	(−7.67)***
LEV	+	0.076	0.089	0.137	0.005
		(2.11)**	(3.13)***	(3.09)***	(0.23)
LAG_LOSS	+	0.011	−0.012	−0.010	0.000
		(0.63)	(−0.85)	(−0.31)	(0.03)
GROWTH	+	0.076	0.116	0.210	0.007
		(2.42)**	(3.93)***	(5.83)***	(0.40)
ΔPPE	+	−0.025	−0.000	−0.076	−0.018
		(−1.83)*	(−0.03)	(−1.84)*	(−1.92)
Industry effects		YES	YES	YES	YES
Year effects		YES	YES	YES	YES
Constant		−0.135	0.230	−0.129	−0.135
		(−2.27)**	(3.71)***	(−1.17)	(−3.13)***
# of observ.		349	349	257	92
R-sq.		0.35	0.36		
Wald-Chi sq.		132.97***	94.02***	100.31***	120.84***

*, **, ***Significant at 10%, 5% and 1% respectively.

Variables: *DA* (raw value of discretionary accruals); *ABSDA* (absolute value of discretionary accruals); *IIDA* (income-increasing discretionary accruals); *IDDA* (income-decreasing discretionary accruals); *FEMALE* (female auditor); *BIG4* (type of audit firm); *LSALES* (client's sales); *CFO* (cash-flow from operations); *LEV* (leverage); *LAG_LOSS* (lagged losses); *GROWTH* (sales growth); and *ΔPPE* (growth rate of gross property plant and equipment).

Table 9

The substitution of audit partners (*MALE-FEMALE* and *MALE-MALE*). Main analysis with *DA* as the dependent variable (*z*-values in parentheses). Additional analyses with *ABSDA*, *IIDA* and *IDDA* as the dependent variables.

Variable	Predicted sign	DA	ABSDA	IIDA	IDDA
MALE-FEMALE	−	−0.065	0.049	−0.106	−0.056
		(−3.12)***	(2.37)**	(−1.99)**	(−2.91)***
MALE-MALE	+/−	−0.101	0.005	−0.20	−0.011
		(−1.33)	(0.71)	(−1.25)	(−1.28)
BIG4	−	0.023	−0.067	−0.000	0.033
		(1.29)	(−2.21)**	(−0.00)	(1.76)*
LSALES	−	0.006	−0.029	−0.030	0.015
		(1.34)	(−4.76)***	(−2.35)**	(2.50)**
CFO	−	−0.642	0.250	−0.849	−0.602
		(−9.95)***	(4.05)***	(−7.83)***	(−10.44)***
LEV	+	0.037	0.064	0.079	0.001
		(2.23)**	(3.00)***	(2.83)***	(0.06)
LAG_LOSS	+	0.007	−0.004	−0.010	−0.004
		(0.76)	(−0.48)	(−0.60)	(−0.45)
GROWTH	+	0.057	0.078	0.125	0.013
		(3.04)***	(4.17)***	(5.40)***	(0.93)
ΔPPE	+	−0.016	−0.013	−0.023	−0.011
		(−1.16)	(−0.92)	(−1.09)	(−0.97)
Industry effects		YES	YES	YES	YES
Year effects		YES	YES	YES	YES
Constant		−0.101	0.193	−0.075	−0.119
		(−4.28)***	(5.11)***	(−1.26)	(−3.94)***
N		713	713	713	713
R-sq.		0.33	0.33		
Wald-Chi sq.		221.45***	134.62***	125.11***	187.88***

*, **, ***Significant at 10%, 5% and 1% respectively.

Variables: *DA* (raw value of discretionary accruals); *ABSDA* (absolute value of discretionary accruals); *IIDA* (income-increasing discretionary accruals); *IDDA* (income-decreasing discretionary accruals); *MALE-FEMALE* (change from male to female auditor); *MALE-MALE* (change from male to male auditor); *LSALES* (client's sales); *CFO* (cash-flow from operations); *LEV* (leverage); *LAG_LOSS* (lagged losses); *GROWTH* (sales growth); and *ΔPPE* (growth rate of gross property plant and equipment).

female auditors, beyond the gender of the auditor. Additionally, the research design of this study does not allow us to address whether the gender effect reported here is explained by differences in skills between male and female auditors, by the glass ceiling in the audit profession or by a combination of both.

This study could be extended by various means. First, it would be interesting to elaborate on the drivers of the relationship between auditor gender and audit quality. While our results do not appear to be

explained by gender differences in audit effort, other issues, such as differences in accounting conservatism, could be further explored. Similarly, additional research on the relative importance of explanations based on gender differences in skills versus those based on the glass ceiling would be needed. Finally, the interaction between female auditors, female CEOs and CFOs, and the presence of women on the audit committee and the financial reporting quality could also be an interesting issue to address and investigate.

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