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Differences in audit pricing between voluntary and mandatory audits

Differences in
audit pricing

Diferencias en el precio de la auditoría entre las auditorías voluntarias y obligatorias

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Abstract

Purpose – Despite the extensive research on the determinants of audit pricing in both public and private settings, there is a lack of research about the differences in audit fees between voluntary audits and mandatory audits. The purpose of this paper is to address this gap.

Design/methodology/approach – First, a theoretical framework is developed to justify differences in audit pricing between voluntary and mandatory audits. Next, using a sample of Spanish private small and medium enterprises (SMEs) running from 2009 to 2014, the authors empirically test whether the fees charged for voluntary audits differ from those charged for mandatory ones. The authors also examine whether the premium observed among large auditors is persistent in the SME setting, and whether this premium differs depending on whether the audits are voluntary or mandatory.

Findings – Although a preliminary analysis does not report significant differences in pricing between voluntary and mandatory audits, additional analyses using samples restricted by company size show that voluntary audits are charged with a premium. The authors observe a premium related to large auditors, and find no significant differences in the audit pricing of Big 4 auditors depending on the mandatory/voluntary nature of the audit, but the premium associated with Middle-Tier auditors disappears in the voluntary setting.

Originality/value – This paper contributes to the previous literature by introducing the examination of differences in audit pricing between voluntary and mandatory audits. As far as the authors know, this is the first study to examine the differences in audit pricing between voluntary and mandatory audits. It also elaborates on studies on audit pricing in SMEs.

Keywords Voluntary audit, Audit fees, Big 4 premium, Middle-Tier auditors, SMEs

Paper type Research paper

Resumen

Objetivo – A pesar de la extensa investigación sobre los determinantes de los honorarios de auditoría tanto en el entorno de las empresas cotizadas como de las no cotizadas, existe poca investigación sobre las diferencias en los honorarios entre las auditorías voluntarias y las obligatorias. El presente estudio aborda esta carencia.

Diseño/metodología/enfoque – En primer lugar, se desarrolla un marco teórico que trata de justificar diferencias en el precio de la auditoría entre auditorías voluntarias y obligatorias. Después, usando una muestra de pymes españolas no cotizadas para el período 2009–2014, testamos empíricamente si los

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honorarios cargados en las auditorías voluntarias difieren de los cargados en las auditorías obligatorias. Examinamos también si la prima observada entre los grandes auditores en el entorno de las pymes es persistente, y si esta prima difiere en función de si la auditoría es voluntaria u obligatoria.

Resultados – Aunque el análisis preliminar no reporta diferencias significativas en el precio de la auditoría entre auditorías voluntarias y obligatorias, análisis adicionales usando muestras restringidas por el tamaño de las compañías muestran que las auditorías voluntarias soportan una prima con respecto a las obligatorias. Observamos también una prima relacionada con los auditores grandes y medianos, y no encontramos diferencias significativas en el precio de la auditoría para las Big 4 en función de la naturaleza obligatoria/voluntaria de la auditoría, mientras que la prima asociada con los auditores medianos desaparece en el entorno voluntario.

Originalidad/Valor – El estudio contribuye a la literatura previa al introducir el análisis de las diferencias en el precio de la auditoría entre auditorías voluntarias y obligatorias. Hasta donde sabemos, éste es el primer estudio que examina las diferencias de precio entre ambos entornos. El estudio también extiende la literatura previa sobre los honorarios de auditoría en las pymes.

Palabras clave Auditoría voluntaria, Honorarios de auditoría, prima Big 4, auditores medianos, pymes

Tipo de papel Trabajo de investigación

1. Introduction

There is an increasing interest in the audit pricing process in the private setting and among small companies, justified by the differences between public and private firms. This can help to shed light on the audit pricing process, by examining the impact that those differences have on audit fees (Niemi, 2002; Chaney *et al.*, 2004; Clatworthy and Peel, 2007; Hope *et al.*, 2012), and by disentangling potential effects that cannot be separated in the public setting (Peel and Roberts, 2003; Hope *et al.*, 2012).

Nevertheless, there is a lack of research on the audit fees of voluntary audits. Although recent papers have examined the determinants of audit fees in small companies (Peel and Roberts, 2003; Sundgren and Svanström, 2013), they do not analyse whether voluntary audits have a differential effect on audit pricing when compared to mandatory ones, because either they only examine small companies which are voluntarily audited (Peel and Roberts, 2003) or the setting examined requires a mandatory audit for virtually all companies, including the smallest of them (Hope *et al.*, 2012; Sundgren and Svanström, 2013).

However, there are reasons to expect audit fees to be affected by whether the audit is voluntary or mandatory. First, previous research on voluntary audits shows that there is a demand for them (Collis *et al.*, 2004; Niemi *et al.*, 2012; Dedman *et al.*, 2013), and papers on the effects of voluntary audits show that these audits have positive effects on the companies that are voluntarily audited (Allee and Yohn, 2009; Lennox and Pittman, 2011; Kim *et al.*, 2011); voluntary audits may be more highly valued than mandatory audits, and thus auditors would charge higher fees for them. Moreover, there is empirical evidence of a fee premium linked to high-quality auditors (Hay *et al.*, 2006; Clatworthy *et al.*, 2009), who are used to signal the management's commitment to high-quality information (Sundgren and Svanström, 2013).

Therefore, as the signalling effect is valued by the stakeholders, and previous literature states that credence goods, such as audits, use pricing to signal quality (Knechel *et al.*, 2008), we can expect an audit fee premium associated with voluntary audits, similar to the one observed for the high-quality auditors, as long as companies that voluntarily purchase an audit want to signal their commitment with accounting quality. Furthermore, as companies which undergo mandatory auditing may consider audits a legal obligation and a costly burden—especially countries such as Spain, without a long tradition of the revision of financial statements—they may look for auditors that charge lower audit fees. Therefore, the aim of this paper is to test whether mandatory and voluntary audits have a different pricing. Comparing voluntarily audited small and medium enterprises (SMEs) with those whose auditing is mandatory, we examine whether the pricing for voluntary audits is different to that of mandatory audits.

Another question to examine in the SME setting is the Big 4 premium observed in previous literature among public and large private companies. Because of the lower levels of reputation and litigation risk in the SME setting, it may be helpful to examine whether the Big 4 premium is persistent across SMEs, and thus to unravel whether this premium is linked to the need for high-quality auditors, potential losses due to litigation and reputation risks, or monopoly power (Hope and Langli, 2010; Hope *et al.*, 2012). Moreover, we can also test the role of the Middle-Tier auditors (Peel and Roberts, 2003; Clatworthy and Peel, 2007; Sundgren and Svanström, 2013). Therefore, we also examine whether there are differences between auditors in the SME setting; i.e., whether the auditor premium observed for large auditors is different when companies are voluntarily audited.

Spain provides an interesting setting to test our hypotheses. In addition to the importance of SMEs in the economy, the legal thresholds for mandatory audits because of size are lower than those established by the European Commission (EC). This allows us to compare companies considered SMEs under the EC definition but whose auditing is mandatory, with voluntarily audited companies, thus reducing the variability in size by excluding companies that are much larger than those voluntarily audited.

Although a preliminary analysis does not report significant differences between voluntary and mandatory audits, additional analyses using samples restricted by company size show that voluntary audits are charged with a premium. Regarding large auditors, while a persistent Big 4 premium is observed across the different analyses, the results for Middle-Tier auditors show that the premium observed among mandatory audits disappears in the voluntary setting. We have to note that the results may be affected by endogeneity problems (Clatworthy *et al.*, 2009; De Fuentes and Pucheta-Martínez, 2009; Huguet and Gandía, 2014). We tackle this issue by carrying out an additional analysis with the propensity score matching (PSM) approach (Clatworthy *et al.*, 2009; Peel and Makepeace, 2012). The results from the additional analysis support the results obtained in the main analysis.

The paper contributes to the previous literature in the following ways: First, it introduces the examination of differences in audit pricing between voluntary and mandatory audits, complementing studies that have examined the differences between these settings in terms of other outcomes, such as the cost of debt (Lennox and Pittman, 2011; Kim *et al.*, 2011; Huguet and Gandía, 2014) or earnings quality (Minnis, 2011; Huguet and Gandía, 2016). As far as we know, this is the first study to examine differences in audit fees between voluntary and mandatory audits. In this sense, the paper shows that auditors follow a different competitive strategy depending on the clients' characteristics. It also extends studies about audit pricing in SMEs (Peel and Roberts, 2003; Sundgren and Svanström, 2013).

The rest of the paper is structured as follows: in Section 2, we develop the theoretical framework and formulate our research hypotheses. Section 3 describes our sample and research design; Section 4 reports the results of the analysis, which are then discussed in Section 5. Finally, Section 6 presents our conclusions and the limitations of the study.

2. Theoretical framework

2.1 Previous literature: audit pricing in private companies and SMEs

Since the seminal work of Simunic (1980), extensive empirical research has been undertaken on the determinants of audit fees (Hay *et al.*, 2006; De Fuentes and Sierra, 2015). Although most of the previous research has focused on public firms (Seetharaman *et al.*, 2002; McMeeking *et al.*, 2007; Fleischer and Goettsche, 2012), recent papers have examined the determinants of audit fees in private companies (Niemi, 2002; Chaney *et al.*, 2004; Clatworthy and Peel, 2007; De Fuentes and Pucheta-Martínez, 2009; Hope *et al.*, 2012; Badertscher *et al.*, 2014). Research on private companies in addition to that carried out in the public setting is justified by the differences between the two types of firms, which may involve differences in the value and pricing of audits. Moreover, the private setting allows researchers to shed light on audit

pricing by controlling for characteristics that cannot be disentangled in public companies, such as the higher variation in the companies' auditor choice and the consideration of different levels of auditors (Peel and Roberts, 2003; Hope *et al.*, 2012).

Therefore, private companies have different information needs and agency conflicts (Chaney *et al.*, 2004; Clatworthy and Peel, 2007; Hope *et al.*, 2012), and auditors face lower levels of reputation and litigation risk (Fortin and Pittman, 2007; Badertscher *et al.*, 2014). Thus, audit fee premiums commonly observed among the Big 4 may be attributed to the auditor effort and the demand for higher quality auditors, rather than potential losses related to reputation and litigation risks (Chaney *et al.*, 2004; Hope and Langli, 2010; Hope *et al.*, 2012).

Furthermore, the different composition of the audit market suggests the existence of audit market segmentation (Peel and Roberts, 2003; Clatworthy *et al.*, 2009), which can involve different strategies employed by the auditors. In the public setting, almost all the companies are audited by the Big 4 auditors, giving rise to concern regarding the lack of competition (Simunic, 1980; Peel and Roberts, 2003). Moreover, because of this high audit market concentration, research on public companies cannot unravel what proportion of the Big 4 premium is due to their monopoly power or to alternative explanations. On the other hand, the more competitive private setting allows researchers to focus on those alternative explanations, as well as consider the role of the Middle-Tier auditors, defined as those firms which, although smaller than the Big 4, are far larger than the rest of the auditors and have significant revenues from consulting and tax services (Peel and Roberts, 2003; Clatworthy and Peel, 2007; Sundgren and Svanström, 2013).

Further research has examined the SME setting. Peel and Roberts (2003) examined audit pricing in a sample of UK micro-firms. They find a fee premium among companies audited by the Big 4 auditors. As the micro-firms' audit market is assumed to be competitive, they interpret it as a consequence of a differentiated audit product, with signalling effects. In the same line, Sundgren and Svanström (2013) examined audit pricing among Swedish SMEs, which were subject to mandatory auditing, regardless of their size. They find that companies audited by Top 6 auditors[1] pay higher fees. As they also find that audit quality is positively associated with auditor size, the results suggest a close relationship between audit quality and audit pricing.

2.2 Voluntary audits and audit fees

To date, no research has been carried out to study the differences in audit pricing between voluntary and mandatory audits. Although some papers have examined audit pricing in the SME setting, they have not studied the existence of these differences, either because they focused on the smallest companies (Peel and Roberts, 2003) or because they are developed in settings where all the companies are subject to mandatory audits (Hope *et al.*, 2012; Sundgren and Svanström, 2013). On the other hand, other papers have studied audit fees in a completely voluntary setting, such as the charity sector (Beattie *et al.*, 2001).

Despite this lack of research, there are reasons to expect differences between voluntary and mandatory audits when examining audit fees. First, previous research on the determinants of voluntary audits (Collis *et al.*, 2004; Niemi *et al.*, 2012; Dedman *et al.*, 2013) shows a demand for audits even among small companies, not addressed by size reasons (the criteria commonly employed to require an audit). On the other hand, previous research has shown that audits have positive effects on companies that voluntarily purchase them, such as better financing conditions (Allee and Yohn, 2009), higher credit ratings (Lennox and Pittman, 2011; Dedman and Kausar, 2012) and a lower cost of debt (Kim *et al.*, 2011; Minnis, 2011).

Therefore, papers that deal with both the determinants and the consequences of voluntary audits show that they are valued, and thus they may have a different value in comparison to

mandatory audits. Prior literature shows that the main distinctive feature of voluntary audits is their signalling effects over the mandatory ones (Lennox and Pittman, 2011). In this sense, companies which choose to be voluntarily audited send a signal about their commitment to accounting quality, a signal which is not present when companies are required to be audited, i.e., in mandatory audits. Nevertheless, financial statement users may consider this commitment not to be true among voluntary audits if companies choose “low-cost” auditors, because they cannot verify whether auditors performed an appropriate audit.

It is worth noting that audits are a form of credence goods (Knechel *et al.*, 2008; Hay and Knechel, 2010). The main feature of these goods (or services) is that the consumer cannot ascertain either the quality of the service or the need for the service, while the seller knows them, creating a situation of asymmetric information. Because of these information asymmetries, price is often the only possible indicator of quality on credence goods (Dulleck and Kerschbamer, 2006; Hay and Knechel, 2010). In the case of voluntary audits, if companies want to signal a true commitment with accounting quality, they have to be willing to pay for this. In contrast, companies that are subject to mandatory audits but are passively compliant (i.e. they choose to opt out if they could) will look for “low-cost” audits.

On the other hand, a competing view is related to market segmentation. Mandatory audits involve a “captive market” in the sense that companies are required to purchase the audit, regardless of the value that they perceive from it. Therefore, there may be a minimum fee below which mandatory audits are not offered, because of the obligation for companies to be audited. In the case of the small companies, however, given that they are not required to be audited, audit firms may have a greater pressure to offer their services at a competitive price, and thus there may be a discount for voluntary audits in comparison to mandatory ones.

Since we expect that the signalling effect of the price on voluntary audits, as well as the “low-cost” audit for passive auditees have a greater theoretical support than the “captive market” view, we formulate the first hypothesis as follows:

H1. Companies that are voluntarily audited pay higher fees than those which are subject to mandatory audits.

2.3 Big 4 and Middle-Tier auditors premium and voluntary audits

Previous research has shown a Big 4 auditor premium, which may be explained by potential losses related to reputation and litigation risks (Seetharaman *et al.*, 2002; Chaney *et al.*, 2004), a lack of competition (Chaney *et al.*, 2003; Ding and Jia, 2012) or actual quality differentials (Clatworthy *et al.*, 2009). The SME setting lets us test whether this Big 4 premium is persistent among this setting, and thus it would be linked to explanations other than the monopoly power exerted by Big 4 auditors among large companies. Since these audit firms are considered to perform higher quality audits, the theoretical framework developed in Section 2.2 about the signalling effect of price on credence goods is applicable to them. A similar premium may also be observed among Middle-Tier auditors, who are considered to provide similar audit quality (Boone *et al.*, 2010; Sundgren and Svanström, 2013; Huguet and Gandía, 2016).

Therefore, we formulate the second hypothesis as follows:

H2. Companies audited by Big 4 (Middle-Tier) auditors pay higher fees than those audited by non-Big (small) auditors.

Finally, based on the market segmentation between voluntary and mandatory audits, we can expect Big 4 and Middle-Tier auditors to use a different competitive strategy for those settings. As explained in Section 2.2, market segmentation between mandatory and voluntary audits may exist, because mandatory audits can be seen as a “captive market,”

while audit firms may be pressured to compete via prices in the voluntary setting. In the case of Big 4 auditors and Middle-Tier auditors, they are considered to perform superior audits, and this higher quality explains their audit fee premiums. Nevertheless, these premiums can become barriers to entry in the voluntary setting, because companies may consider Big 4 auditors and Middle-Tier auditors are “too good” to perform audits in small companies.

However, similarly to the car segments in the automobile industry, audit firms may have an interest in accessing the “A-segment” of the market, which would require them to offer low-class services at a lower price. Accordingly, in order to access the voluntary setting, Big 4 and Middle-Tier auditors may be willing to reduce the premium they charge on mandatory audits. Therefore, we formulate the third hypothesis as follows:

H3. The Big 4 (Middle-Tier) premium is different depending on whether the audit is voluntary or mandatory.

3. Empirical study

3.1 Sample

The database employed for sample selection is SABI, which contains financial information of Spanish companies. Our sample period runs from 2009 to 2014. We initially selected data from audited private companies that have been, for the whole sample period, below at least two out of the following thresholds: €6,000,000 for the total assets; €12,000,000 for the net turnover; and 50 employees. These limits are the maximum thresholds established by the Directive 2013/34/EU to consider a company as small and thus for it to be exempt from the audit requirement[2].

In practice, however, most European Union (EU) members apply lower Statutory Audit Thresholds (SAT). In the Spanish case, private companies are not required to be audited if they do not exceed two out of three criteria for two consecutive years: €2,850,000 for the total assets; €5,700,000 for the net turnover; and 50 employees. The use of the maximum EU limits, which are higher than the Spanish SAT, lets us compare audit fees for mandatory and voluntary audits, avoiding an excessive variation in company size within the sample.

Therefore, our sample is composed of audited companies, both below Spanish SAT (i.e. voluntarily audited) and above Spanish SAT (i.e. subject to mandatory audits), so we can examine the differences in audit pricing depending on whether the audits are voluntary or mandatory. We have to note that, although companies below SAT are exempt from audit by size criteria, they are required to be audited in certain conditions (e.g. if 5 per cent of the share capital demands it). However, since SABI does not include information regarding the reason a company is audited, we cannot state which companies audited below SAT are subject to mandatory audits, and thus we have to make the assumption that companies audited below SAT belong to the voluntary setting.

Observations of companies without the availability of audit fees data are excluded. We also exclude observations from companies in financial and insurance industries, firms having unlimited liability and firms with share participation by public entities. We eliminate observations that cannot be classified as either mandatory or voluntarily audited because of size[3]. We also eliminate observations with negative values for assets and/or liabilities. Finally, to alleviate the influence of outliers, continuous variables are truncated at percentiles 1 and 99.

Table I, Panel A, shows the original sample distribution. We can see that 39.09 per cent of the total sample is below SAT and thus supposedly voluntarily audited. According to the statements of the chairman of ICJCE[4] that appeared in the press (ABC, El Economista), voluntary audits represent 27 per cent of total audits and this percentage has increased in

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audit pricing*Panel A: original sample*

Year	Voluntary	%	Mandatory	%	Total
2009	3,189	25.60	9,268	74.40	12,457
2010	4,860	37.30	8,170	62.70	13,030
2011	5,114	38.24	8,259	61.76	13,373
2012	5,408	40.31	8,009	59.69	13,417
2013	6,067	45.61	7,236	54.39	13,303
2014	5,849	47.15	6,556	52.85	12,405
Total	30,487	39.09	9,268	60.91	77,985

Panel B: sample with audit fees data available

Year	Voluntary	%	Mandatory	%	Total
2009	1,042	11.72	7,850	88.28	8,892
2010	1,430	16.84	7,061	83.16	8,491
2011	1,918	20.63	7,378	79.37	9,296
2012	2,201	23.59	7,129	76.41	9,330
2013	1,967	24.68	6,003	75.32	7,970
2014	1,556	25.77	4,481	74.23	6,037
Total	10,114	20.22	39,902	79.78	50,016

Panel C: final sample after eliminations and exclusions

Year	Voluntary	%	Mandatory	%	Total
2009	555	8.13	6,274	91.87	6,829
2010	924	13.54	5,899	86.46	6,823
2011	1,124	16.18	5,824	83.82	6,948
2012	1,160	17.31	5,542	82.69	6,702
2013	1,262	19.74	5,130	80.26	6,392
2014	964	20.12	3,828	79.88	4,792
Total	5,989	15.56	32,497	84.44	38,486

Panel D: sample distribution of audited companies by auditor choice

Year	Small auditors	Mid-Tier auditors	Big 4 auditors	Total
2009	5,718	331	780	6,829
2010	5,608	337	878	6,823
2011	5,856	275	817	6,948
2012	5,612	270	820	6,702
2013	5,205	259	928	6,392
2014	3,859	183	750	4,792
Total	31,858	1,655	4,973	38,486
Voluntary	4,502 (75.17%)	361 (6.03%)	1,126 (18.80%)	5,989
Mandatory	27,356 (84.18%)	1,294 (3.98%)	3,847 (11.84%)	32,497
Total	31,858 (82.78%)	1,655 (4.30%)	4,973 (12.92%)	38,486

Notes: This table presents the sample distribution of the original sample, after excluding the observations of companies lacking the availability of audit fees date, and the final sample after eliminations and exclusions. Panel D shows the sample distribution of the audited companies by auditor choice

Table I.
Sample distribution

recent years. Although our proportion of voluntary audits is higher, we have to note that we have not included the companies that exceed the maximum EU thresholds, so we consider that our sub-sample of voluntary audits is in line with those estimations. Table I, Panel B, shows the sample distribution after excluding those observations lacking the availability of audit fees data. We can see that an important proportion of voluntarily audited companies do not report audit fees in their notes and thus are excluded from the sample, as are 7,596 observations from mandatory audits. After these exclusions, 20.22 per cent of our sample is below SAT.

Table I, Panel C, reports the final sample after the rest of the exclusions and eliminations. The final sample has 38,486 firm-year observations from 11,269 companies. Panel D of

Table I reports the sample distribution by auditor choice. Despite the low number of companies audited by Big 4 and Middle-Tier auditors (BDO and Grant Thornton), there are a higher proportion of audits by these auditors among companies below SAT.

3.2 Research design

To test the hypotheses, we use the following regression model:

$$LNFEES_{it} = \alpha + \beta_1 VOLUNTARY_{it} + \beta_2 LARGE_{it} + \beta_3 VOLUNTARY_{it} \times LARGE_{it} \\ + \beta_4 BIG_{it} + \beta_5 VOLUNTARY_{it} \times BIG_{it} + \gamma CONTROL + \varepsilon_{it}.$$

The dependent variable is the natural logarithm of the audit fees paid by the company. *VOLUNTARY* is a dummy, which equals 1 when a company is voluntarily audited and 0 otherwise, and tests whether audit fees are different depending on whether the audits are voluntary or mandatory. We also include two proxies for auditor choice: *LARGE*, which equals 1 for companies audited by a Big 4 or a Middle-Tier firm and 0 otherwise; and *BIG*, which equals 1 for companies audited by a Big 4 auditor and 0 otherwise. We have considered BDO and Grant Thornton as Middle-Tier firms (Boone *et al.*, 2010; Sundgren and Svanström, 2013).

LARGE shows the differences between the two groups of auditors (Big 4 and Middle-Tier firms) and the small auditors, while *BIG* captures the differences between the Big 4 and Middle-Tier auditors (Huguet and Gandía, 2014, 2016). Therefore, the effect of Middle-Tier auditors on audit fees is observed from β_2 , while the effect of Big 4 auditors is shown by the sum of $\beta_2 + \beta_4$. Furthermore, we include two interaction variables: the interaction between *VOLUNTARY* and *LARGE*, and the interaction between *VOLUNTARY* and *BIG*. With these variables, we test whether there is a different pricing for Big 4 and Middle-Tier auditors in the voluntary setting.

The model includes a set of 29 control variables that have been used in previous research, which can be classified in five groups: company size; company complexity; company risk; auditor characteristics; and other characteristics. These variables are defined in the list below (the list shows the variables used in our analysis, as well as their definition). The model also includes year and industry dummies to control for unobserved effects common to all the companies.

Variables:

(1) Dependent variable:

- *LN_FEES*: natural logarithm of audit fees.

(2) Test variables:

- *VOLUNTARY*: dummy = 1 if company is voluntarily audited.
- *LARGE*: dummy = 1 if company is audited by a Big 4 or a Middle-Tier auditor.
- *VOLUNTARY_LARGE*: interaction between *VOLUNTARY* and *LARGE*.
- *BIG*: dummy = 1 if company is audited by a Big 4 auditor.
- *VOLUNTARY_BIG*: interaction between *VOLUNTARY* and *BIG*.

(3) Control variables:

- Company size:
 - *LN_ASSETS*: natural logarithm of total assets.
 - *LN_SALES*: natural logarithm of net turnover.
 - *LN_EMPLOYEES*: natural logarithm of number of employees.

-
- Company complexity:
 - *INVENTORY_&_RECEIVABLE*: proportion of inventory and receivable over total assets.
 - *ACQUISITIONS*: dummy = 1 if company has carried out acquisitions.
 - *INTANGIBLE_ASSETS*: proportion of intangible assets.
 - *UNUSUAL*: dummy = 1 if company reports unusual items in the income statement.
 - *SIMPLIFIED_GAAP*: dummy = 1 if company uses simplified GAAP.
 - *CHANGE_EQUITY*: dummy = 1 when changes in the share capital have been placed between t and $t-1$.
 - *NUMBER_SUBSIDIARIES*: number of subsidiaries.
 - *GROUP*: dummy = 1 for companies belonging to a group.
 - *SECONDARY_INDUSTRIES*: number of secondary industries in which the company is acting.
 - Company risk:
 - *LEVERAGE*: leverage (ratio between total liabilities and total assets).
 - *CHANGE_LEVERAGE*: changes in leverage between t and $t-1$.
 - *GROWTH*: company growth (growth in sales).
 - *ROA*: profitability (ROA).
 - *NEGATIVE_EARNINGS*: presence of negative earnings.
 - *NEGATIVE_ROA*: interaction between *ROA* and *NEG_EARN*.
 - *CURRENT*: ratio between current assets and current liabilities.
 - *QUICK*: ratio of current assets excluding inventories to current liabilities.
 - *SOLVENCY*: ratio of share capital to total assets.
 - *CHANGE_SOLVENCY*: changes in solvency.
 - Auditor characteristics
 - *AUDITOR_CHANGE*: dummy = 1 if auditor switches.
 - *OPT_IN*: dummy = 1 if company is audited in t but unaudited in $t-1$.
 - *MODIFIED_REPORT*: presence of modified reports.
 - Other variables:
 - *YEAR_END*: dummy = 1 if year-end on 31st December.
 - *CAPITAL_CITY*: dummy = 1 if company is located in Madrid or Barcelona.
 - *LN_AGE*: natural log of the company age.
 - *SQ_LNAGE*: squared term of *LNAGE*.

The model is estimated using an OLS regression, employing robust standard errors clustered at firm level (Hope and Langli, 2010; Hope *et al.*, 2012; Sundgren and Svanström, 2013). However, we are aware of the potential endogeneity problems related with this estimation, common to other audit-based studies (Huguet and Gandía, 2014).

Endogeneity may arise because the auditor choice (Big 4 vs Middle-Tier vs Small auditors) is the result of a corporate decision rather than a random assignment; similarly, mandatory (voluntary) audits are not randomly assigned but depend on company size (corporate decisions). Therefore, OLS estimations may be affected by a potential self-selection bias (Kim *et al.*, 2011).

Although previous studies have used a Heckman two-stage approach to solve this problem (Ireland and Lennox, 2002; Chaney *et al.*, 2004; McMeeking *et al.*, 2007), recent literature shows that the Heckman approach depends on a proper selection of the instrumental variables and its results lack robustness, as they are even more biased and unreliable than OLS estimations (Clatworthy *et al.*, 2009; Larcker and Rusticus, 2010; Lennox *et al.*, 2012). Fixed-effects regressions models (Kim *et al.*, 2011; Lennox *et al.*, 2012) do not completely solve the problem either, because they need the source of endogeneity to be time invariant, and variables that are fixed over time are systematically excluded from the model. Furthermore, unreported preliminary analyses show that most of the variables included in our analysis have little variation, so fixed effects estimation may lead to considerable efficiency loss (Cameron and Trivedi, 2009).

On the other hand, the study also presents comparability problems: since voluntarily audited companies are systematically smaller than those subject to mandatory audits ones, it may be argued that these two subsets are not comparable. Matching methods try to solve both endogeneity and comparability problems by matching the observations of the “treatment” variable to untreated observations with similar characteristics. In that sense, matching is an intuitive and logical method of controlling for bias, which may cause endogeneity (Peel, 2014). However, a problem arises when the number of characteristics (variables) to be matched is high, what is known as “the curse of dimensionality” (Bernal and Peña, 2011). The PSM approach overcomes this problem by matching observations on only one variable, which is estimated from a Probit selection equation (Clatworthy *et al.*, 2009; Bernal and Peña, 2011; Peel and Makepeace, 2012; Badertscher *et al.*, 2014). Then, the average value of the dependent variable is compared through the matched sub-samples (treatment and control samples, matched by the propensity score) to test whether there are differences between them. Compared to regression methods, PSM methods have the advantage that they do not require functional form or specification assumptions (Peel, 2014).

In order to enhance the comparability between the companies below and above SAT, we also carried out an additional analysis employing three restricted samples in which we excluded: micro-companies; companies above standard EU SAT[5], which are subject to mandatory audits; and both micro-companies and companies above standard EU SAT. Furthermore, we also tested the potential premium among Big 4 and Middle-Tier auditors in separate regressions for the voluntary and the mandatory settings. Finally, to test how OLS results are affected by the potential endogeneity problems, we carried out an additional analysis using the PSM approach.

4. Results

4.1 Preliminary analysis

Table II reports the descriptive statistics of the variables used in the study. Univariate analysis shows that, on average, audit fees are higher for mandatory audits than for voluntary audits. However, we have to note that we are not controlling for other audit fees determinants. Moreover, companies subject to mandatory audits are larger (expressed in terms of assets, turnover, and employees), have a higher proportion of inventory and receivables, operate in more industries, have a higher number of subsidiaries, higher leverage and are more profitable and older. On the other hand, voluntarily audited companies have a higher proportion of intangible assets, higher growth and greater financial soundness.

Differences in
audit pricing

Panel A: distributional properties (38,486 observations)

Variable	Mean	SD	Smallest	25%	50%	75%	Largest
LN_FEES	2.0075	0.4291	0.6981	1.7385	1.9750	2.2579	3.3254
VOLUNTARY	0.1556	0.3625	0.0000	0.0000	0.0000	0.0000	1.0000
LARGE	0.1722	0.3776	0.0000	0.0000	0.0000	0.0000	1.0000
VOLUNTARY_LARGE	0.0386	0.1927	0.0000	0.0000	0.0000	0.0000	1.0000
BIG	0.1292	0.3354	0.0000	0.0000	0.0000	0.0000	1.0000
VOLUNTARY_BIG	0.0293	0.1685	0.0000	0.0000	0.0000	0.0000	1.0000
LN_ASSETS	8.7031	0.6454	6.2237	8.3131	8.6885	9.0774	11.2732
LN_SALES	8.9331	0.6762	5.1325	8.6165	8.9500	9.2956	10.9363
LN_EMPLOYEES	3.3702	0.8321	0.0000	2.9444	3.4340	3.8712	5.5607
INVENTORY_& RECEIVABLE	0.5193	0.2365	0.0037	0.3490	0.5310	0.7053	0.9681
ACQUISITIONS	0.4894	0.4999	0.0000	0.0000	0.0000	1.0000	1.0000
INTANGIBLE_ASSETS	0.0132	0.0427	0.0000	0.0000	0.0005	0.0048	0.4197
UNUSUAL	0.0018	0.0429	0.0000	0.0000	0.0000	0.0000	1.0000
SIMPLIFIED_GAAP	0.3394	0.4735	0.0000	0.0000	0.0000	1.0000	1.0000
CHANGE_EQUITY	0.1602	0.3668	0.0000	0.0000	0.0000	0.0000	1.0000
NUMBER_SUBSIDIARIES	0.7464	1.3036	0.0000	0.0000	0.0000	1.0000	8.0000
GROUP	0.5611	0.4963	0.0000	0.0000	1.0000	1.0000	1.0000
SECONDARY_INDUSTRIES	1.0330	0.9606	0.0000	0.0000	1.0000	2.0000	7.0000
LEVERAGE	0.5491	0.2441	0.0399	0.3565	0.5593	0.7408	1.3600
CHANGE_LEVERAGE	-0.0123	0.0742	-0.3299	-0.0475	-0.0115	0.0213	0.3608
GROWTH	-0.0244	0.2240	-0.7660	-0.1411	-0.0212	0.0830	1.2847
ROA	0.0228	0.0728	-0.4409	0.0015	0.0178	0.0518	0.3067
NEGATIVE_EARNINGS	0.2197	0.4141	0.0000	0.0000	0.0000	0.0000	1.0000
NEGATIVE_ROA	-0.0139	0.0432	-0.4409	0.0000	0.0000	0.0000	0.0000
CURRENT	2.2012	1.9360	0.1930	1.1463	1.5572	2.4808	20.7717
QUICK	1.6731	1.6319	0.0891	0.7767	1.1665	1.9213	15.9000
SOLVENCY	0.0889	0.1496	0.0000	0.0118	0.0351	0.1039	5.0770
CHANGE_SOLVENCY	0.0028	0.0470	-3.4005	-0.0021	0.0001	0.0037	1.3378
AUDITOR_CHANGE	0.0651	0.2467	0.0000	0.0000	0.0000	0.0000	1.0000
OPT_IN	0.0869	0.2816	0.0000	0.0000	0.0000	0.0000	1.0000
MODIFIED_REP	0.2482	0.4320	0.0000	0.0000	0.0000	0.0000	1.0000
YEAR_END	0.9486	0.2208	0.0000	1.0000	1.0000	1.0000	1.0000
CAPITAL_CITY	0.1679	0.3738	0.0000	0.0000	0.0000	0.0000	1.0000
LN_AGE	2.9788	0.5601	1.0986	2.6391	3.0910	3.3673	4.2047
SQ_LNAGE	9.1867	3.1502	1.2069	6.9646	9.5545	11.3387	17.6794

Panel B: mean and SD of continuous variables by audit status

Variable	Voluntary audit (5,989 observations)		Mandatory audit (32,497 observations)		Test for mean differences	
	Mean	SD	Mean	SD	Diff.	t
LN_FEES	1.8173	0.4626	2.0425	0.4132	-0.2252	-38.02***
LN_ASSETS	8.1920	0.8419	8.7973	0.5529	-0.6054	-70.93***
LN_SALES	8.0347	0.6853	9.0987	0.5280	-1.0640	-136.23***
LN_EMPLOYEES	2.9483	0.8552	3.4479	0.8040	-0.4997	-43.75***
INVENTORY_& RECEIVABLE	0.4339	0.2586	0.5350	0.2288	-0.1010	-30.75***
ACQUISITIONS	0.0172	0.0540	0.0125	0.0402	0.0047	7.78***
NUMBER_SUBSIDIARIES	0.6604	1.2781	0.7622	1.3076	-0.1018	-5.56***
SECONDARY_INDUSTRIES	1.0120	0.9697	1.0369	0.9589	-0.0249	-1.84***
LEVERAGE	0.5027	0.2593	0.5576	0.2402	-0.0549	-16.04***
CHANGE_LEVERAGE	-0.0047	0.0833	-0.0137	0.0724	0.0090	8.62***
GROWTH	-0.0122	0.2497	-0.0267	0.2189	0.0145	4.60***
ROA	0.0095	0.0868	0.0252	0.0696	-0.0157	-15.35***
NEGATIVE_ROA	-0.0241	0.0569	-0.0120	0.0399	-0.0121	-20.10***
CURRENT	2.5041	2.3904	2.1454	1.8346	0.3588	13.21***
QUICK	1.9514	2.0060	1.6219	1.5478	0.3295	14.40***
SOLVENCY	0.1481	0.2132	0.0780	0.1318	0.0701	33.81***
CHANGE_SOLVENCY	0.0015	0.0711	0.0030	0.0411	-0.0015	-2.22**
LN_AGE	2.9600	0.5768	2.9822	0.5568	-0.0222	-2.82***

Notes: *, **, ***Significant at 10, 5 and 1 per cent levels, respectively

Table II.
Descriptive statistics

According to the estimation of the model explained in Section 3.2, we estimated the correlation matrix (Table III) and calculated the variance inflation factors (VIFs, unreported) for the variables of the model to rule out potential multicollinearity problems. With the exception of the correlation between *CURRENT* and *QUICK* (0.8892), all the correlations are below 0.80; furthermore, VIFs are below 10. Therefore, we did not expect severe multicollinearity problems (Clatworthy and Peel, 2007; Huguët and Gandía, 2014). Next, we ran the model in the total sample, and the results are shown in Table IV. The first column reports the results of the regression with only the test variables; the second column shows the results of regressing *LN_FEES* on the control variables; finally, the third column shows the results of the complete model.

We can see that the explanatory power of the model is significantly increased when we employ the full model. On the other hand, although it seems that the R^2 is lower than in previous studies, we have to note that companies included in this study are smaller than the ones included in the previous studies, and the results are in line with Peel and Roberts (2003), who focused on micro-firms. Moreover, a lower R^2 among private companies has also been observed when they are compared to public companies, and this is strongly linked to corporate size (Clatworthy and Peel, 2007; Hope and Langli, 2010). Therefore, low R^2 is a consequence of the lower sensitivity of audit pricing to changes in corporate size, rather than misspecification problems.

We can see that, when performing the regression with only the test variables, *VOLUNTARY* shows a significantly negative coefficient. However, after including the control variables, its significance disappears, and thus there would be no differences in audit pricing, which depend on whether the audits are voluntary or mandatory. This illustrates the importance of controlling for characteristics that may affect audit fees. Particularly, results in Column 1 may involve that *VOLUNTARY* is capturing the effect of *LN_ASSETS*, *LN_SALES* and *LN_EMPLOYEES*, which are size variables that determine whether a company is classified as subject to voluntary or mandatory audits. We have to note, however, that the lack of significance of *VOLUNTARY* may be due to comparability problems between companies below and above SAT: while companies below SAT are *a priori* voluntarily audited, companies above SAT may either purchase audits on a voluntary basis, or be “passively compliant” firms which are only audited because this is required of them. To overcome this problem, we carried out an additional analysis in Section 4.2, in which we exclude the largest companies from the sample to enhance the comparability between firms below and above SAT.

Regarding the audit size variables, we observe that both *LARGE* and *BIG* have a significantly positive coefficient, which is in line with prior literature. Since auditors in the SME setting face lower litigation and reputation risks, and the market concentration is much lower than for larger companies, the audit premium would be related to a demand for higher quality auditors, rather than to potential losses connected with litigation and reputation risks (Hope and Langli, 2010; Hope *et al.*, 2012) or monopoly power. With regard to the interaction variables, we can see that the interaction between *VOLUNTARY* and *BIG* is not significant, so the pricing is not different for Big 4 auditors, regardless of whether audited firms belong to the voluntary or the mandatory setting. However, the interaction between *LARGE* and *VOLUNTARY* is significantly negative, indicating a lower premium among Middle-Tier auditors in the voluntary setting. These results suggest that Middle-Tier auditors employ a different strategy depending on the market segment they are working in. We explore these in more detail in Sections 4.2, 4.3 and 4.4.

With regard to the control variables, they are in line with prior literature: company size, proxied by *LN_ASSETS*, *LN_SALES* and *LN_EMPLOYEES*, is positively associated with audit fees. Regarding the company complexity, proxied by several variables such as *INVENTORY_RECEIVABLE*, *INTANGIBLE_ASSETS* or *SIMPLIFIED_GAAP*, results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
LN_FEES	1												
VOLUNTARY	-0.1953	1.0000											
LARGE	0.3232	0.0875	1.0000										
BIG	0.3574	0.0747	0.8467	1.0000									
VOLUNTARY_LARGE	0.0106	0.4713	0.4446	0.3776	1.0000								
VOLUNTARY_BIG	0.0431	0.4079	0.3848	0.4544	0.8655	1.0000							
LN_ASSETS	0.2576	-0.3485	0.0300	0.0326	-0.1418	-0.1227	1.0000						
LN_SALES	0.2601	-0.5728	-0.0132	-0.2773	-0.2396	-0.2773	0.4459	1.0000					
LN_EMPLOYEES	0.1355	-0.2203	0.0008	0.0057	-0.1008	-0.0835	0.0007	0.0520	1.0000				
INVENTORY_& RECEIVABLE	0.0865	-0.1584	-0.0506	-0.1027	-0.0931	-0.0609	0.3203	-0.0881	1.0000				
ACQUISITIONS	-0.0109	-0.0266	-0.0007	0.0055	0.0083	0.1377	0.1516	0.0237	0.0224	1.0000			
INTANGIBLE_ASSETS	0.0348	0.0469	0.0842	0.0704	0.0615	0.0398	-0.0018	0.0570	-0.1191	0.0061	1.0000		
UNUSUAL	0.0134	-0.0064	0.0130	0.0150	0.0027	0.0022	0.0020	-0.0073	0.0061	-0.0029	-0.0095	1.0000	
SIMPLIFIED_GAAP	-0.1585	0.2678	-0.1090	-0.0976	0.1276	0.1063	-0.1771	-0.2424	-0.0755	0.0096	0.0048	-0.0309	1.0000
CHANGE_EQUITY	-0.0038	-0.0051	-0.0204	-0.0176	-0.0011	0.0029	0.0211	0.0129	0.0276	0.0319	0.0239	0.0131	0.0203
NUMBER_SUBSIDIARIES	0.0366	-0.0310	-0.0376	-0.0504	-0.0197	-0.0245	0.1954	0.0128	0.0383	0.0136	0.0480	-0.0033	-0.0245
GROUP	0.0492	-0.0318	0.0089	0.0013	-0.0111	-0.0084	0.1116	0.0345	0.0392	0.0186	0.0553	0.0081	-0.0232
SECONDARY_INDUSTRIES	0.0346	-0.0073	0.0202	0.0184	0.0068	0.0033	-0.0050	0.0182	0.0172	0.0499	0.0010	0.0151	-0.0186
LEVERAGE	0.0086	-0.0784	0.0478	0.0365	-0.0210	-0.0274	-0.0515	0.1787	-0.0370	0.3185	0.0041	0.0466	0.0127
CHANGE_LEVERAGE	0.0203	0.0442	0.0300	0.0229	0.0300	0.0253	0.0489	-0.0027	0.0364	0.0337	0.3044	0.0202	0.0108
GROWTH	-0.0036	0.0287	0.0189	0.0191	0.0273	0.0255	0.0855	0.2764	0.0388	0.0582	0.3510	0.0384	-0.0247
ROA	-0.0068	-0.0810	0.0138	0.0178	-0.0205	-0.0128	0.1025	0.2051	-0.0231	0.0631	0.2564	-0.0378	-0.0175
NEGATIVE_EARNINGS	0.0274	0.1116	0.0674	0.0594	0.0558	0.0433	-0.1112	-0.2298	0.0372	-0.0396	-0.2461	0.0346	0.0191
NEGATIVE_ROA	-0.0481	-0.1045	-0.0916	-0.0838	-0.0736	-0.0663	0.1674	0.2076	-0.0417	0.0161	0.1958	-0.0403	-0.0196
CURRENT	0.0177	0.0623	-0.0130	-0.0107	0.0330	0.0340	0.1544	-0.1400	-0.0421	-0.1130	0.0008	-0.0529	-0.0118
QUICK	0.0183	0.0708	0.0443	0.0463	0.0622	0.0610	0.0704	-0.1422	0.0022	-0.2503	0.0327	-0.0295	-0.0100
SOLVENCY	0.0024	0.1716	0.1536	0.1665	0.1447	0.1504	-0.1050	-0.2103	-0.0268	-0.1316	-0.0802	0.0620	0.0369
CHANGE_SOLVENCY	0.0049	-0.0094	-0.0038	-0.0053	-0.0127	-0.0169	-0.0575	-0.0445	-0.0052	-0.0043	-0.2075	-0.0049	0.0085
AUDITOR_CHANGE	-0.0143	-0.0028	0.0264	0.0099	0.0130	0.0099	0.0160	0.0077	0.0109	0.0026	-0.0053	0.0062	0.0097
OPT_IN	-0.1019	0.1652	-0.0053	-0.0092	0.0696	0.0557	-0.1149	-0.1451	-0.0636	-0.0362	0.0203	0.0103	0.0054
MODIFIED_REPORT	0.0717	-0.0332	0.0378	0.0402	-0.0222	-0.0119	0.0063	-0.0296	0.0029	0.0073	-0.0235	0.0374	-0.0180
YEAR_END	-0.0849	-0.0061	-0.0878	-0.0902	-0.0357	-0.0368	0.0148	-0.0220	-0.0192	0.0286	-0.0134	0.0010	-0.0056
AGE	0.0878	-0.0173	-0.0797	-0.0761	-0.0559	-0.0552	0.0809	-0.0069	0.1122	-0.0374	-0.0340	-0.0673	-0.0052
CHANGE_EQUITY	1.0000												
NUMBER_SUBSIDIARIES	0.0253	1.0000											

(continued)

Differences in
audit pricingTable III.
Correlation matrix

Differences in
audit pricing

Variable	Test variables		Control variables		Full model	
	Coefficient	<i>t</i>	Coefficient	<i>t</i>	Coefficient	<i>t</i>
<i>VOLUNTARY</i>	-0.2298	-21.42***			-0.0060	-0.53
<i>LARGE</i>	0.1269	6.44***			0.0906	4.79***
<i>VOLUNTARY_LARGE</i>	-0.1010	-2.78***			-0.0782	-2.36**
<i>BIG</i>	0.3883	16.08***			0.3814	16.58***
<i>VOLUNTARY_BIG</i>	-0.0466	-1.03			-0.0255	-0.62
<i>LN_ASSETS</i>			0.1408	18.42***	0.1156	16.15***
<i>LN_SALES</i>			0.1037	12.64***	0.0998	12.22***
<i>LN_EMPLOYEES</i>			0.0589	11.31***	0.0606	12.31***
<i>INVENTORY_&_RECEIVABLE</i>			0.1708	8.52***	0.1500	8.07***
<i>ACQUISITIONS</i>			-0.0363	-7.00***	-0.0282	-5.77***
<i>INTANGIBLE_ASSETS</i>			0.2984	3.19***	0.2108	2.42**
<i>UNUSUAL</i>			0.0743	1.39	0.0462	1.04
<i>SIMPLIFIED_GAAP</i>			-0.0469	-6.11***	-0.0136	-1.86*
<i>CHANGE_EQUITY</i>			-0.0096	-1.33	0.0045	0.67
<i>NUMBER_SUBSIDIARIES</i>			-0.0061	-1.71*	0.0037	1.06
<i>GROUP</i>			0.0183	1.99**	0.0123	1.45
<i>SECONDARY_INDUSTRIES</i>			0.0139	3.44***	0.0120	3.19***
<i>LEVERAGE</i>			-0.0247	-1.10	-0.0629	-2.97***
<i>CHANGE_LEVERAGE</i>			0.0204	0.54	0.0142	0.41
<i>GROWTH</i>			-0.1084	-9.49***	-0.1014	-9.29***
<i>ROA</i>			0.5937	7.08***	0.1756	2.35**
<i>NEGATIVE_EARNINGS</i>			0.0338	4.01***	0.0120	1.50
<i>NEGATIVE_ROA</i>			-1.3139	-11.39***	-0.7449	-7.05***
<i>CURRENT</i>			-0.0187	-4.63***	-0.0059	-1.53
<i>QUICK</i>			0.0260	5.23***	0.0087	1.87*
<i>SOLVENCY</i>			0.1661	5.12***	0.0074	0.25
<i>CHANGE_SOLVENCY</i>			-0.0911	-1.41	0.0072	0.11
<i>AUDITOR_CHANGE</i>			-0.0345	-4.21***	-0.0477	-6.05***
<i>OPT_IN</i>			-0.0472	-6.56***	-0.0439	-6.44***
<i>MODIFIED_REPORT</i>			0.0710	9.11***	0.0553	7.75***
<i>YEAR_END</i>			-0.1413	-6.94***	-0.0861	-4.98***
<i>CAPITAL_CITY</i>			0.0940	7.81***	0.0713	6.49***
<i>LN_AGE</i>			-0.1404	-2.98***	-0.0886	-1.99***
<i>SQ_LNAGE</i>			0.0335	3.97***	0.0257	3.24***
Intercept	1.9765	463.14***	-0.2064	-1.51	-0.2910	-1.39
<i>n</i>	38,846		38,486		38,486	
<i>F</i>	361.99		48.61		69.71	
<i>R</i> ² (%)	18.06		17.62		28.17	

Notes: This table shows the OLS regression results, clustering robust standard errors at firm level. Column 1 reports results for regression *LN_FEES* on the test variables. Column 2 reports the results for the control variables model. Column 3 reports results for the complete model. Coefficients of industry and year dummies are not included for parsimony. *, **, ***Significant at 10, 5 and 1 per cent levels, respectively

Table IV.
OLS regression results

show that more complex companies are generally charged with higher fees. With regard to the company risk characteristics, variables such as *GROWTH* and *CURRENT* have a significant negative coefficient, showing that less risky companies are charged with lower fees. Audit characteristics have the expected sign: companies with auditor changes have lower audit fees, whereas companies that have received a modified report are charged with higher fees. The rest of control variables (*YEAR_END*, *CAPITAL_CITY* and *AGE*) are also significant.

4.2 Restricted samples

In order to enhance the comparability of the companies below and above SAT, we carried out three additional regressions. First, we ran the regression model excluding the

micro-companies according to their definition in the Spanish GAAP[6]. This exclusion discards the smallest companies in the sample, which may not be comparable with those near the current SAT. With regard to the second regression, we restricted the sample by excluding the companies that are above the standard EU criteria for considering that a company should be subject to mandatory audits (total assets of €4,000,000, turnover of €8,000,000 and 50 employees). This exclusion affects the largest companies in our sample, which are far larger than those near the Spanish SAT. To conclude, we ran a final regression excluding both micro-companies and firms above EU SAT.

The results are reported in Table V. Regarding the exclusion of micro-companies, the results are similar to those reported in Table IV. However, when we exclude the companies above EU SAT, *VOLUNTARY* becomes significantly positive in the two regressions. These results, although opposite to those reported in Section 4.1, partly support the hypothesis that voluntarily audited companies are willing to pay more for the audit than the “passively compliant” companies subject to mandatory audit. We have to note that the exclusion of the largest companies enhances the comparability between voluntary and mandatory audits, because they are more similar in size. However, we acknowledge that these results are not conclusive: given that endogeneity issues may affect the results in both analyses, we carried out an additional analysis in Section 4.4 using a PSM procedure.

Regarding *LARGE* and *BIG*, both variables are highly significant and positive. Moreover, the interaction between *VOLUNTARY* and *LARGE* is significantly negative. These results, which support those reported in Table IV, may indicate that Middle-Tier auditors are willing to reduce their premium for the purpose of accessing the SMEs market, and thus they follow a different competitive strategy than among larger companies. In order to test the robustness of these results, we examine the Big 4 and Middle-Tier premium separately for the voluntary and the mandatory setting in Section 4.3. Moreover, we also apply the PSM approach for these variables in Section 4.4.

4.3 Big 4 and Middle-Tier premium—mandatory vs voluntary audits

We have observed in the previous sections that, while the Big 4 premium is persistent in both voluntary and mandatory audits, the Middle-Tier premium is negatively affected in the voluntary setting. As an additional analysis to those results, we split the total sample into companies below and above SAT, to test whether the auditor size premium observed remains after separately examining voluntary and mandatory audits[7]. The results from these restricted samples are reported in Table VI.

We can see that *BIG* remains significantly positive in both regressions, while *LARGE* is not significant in the voluntary setting. Taken together, the results suggest that, while the Big 4 premium is persistent in both settings, the premium of Middle-Tier auditors is only evident among mandatory audits, and they may not charge a premium among smaller companies.

4.4 Propensity score matching results

Because of the endogeneity problems explained in Section 3.2, we carried out an additional analysis using a PSM approach (Clatworthy and Peel, 2007; Peel and Makepeace, 2012). PSM methods match observations of the “treatment” variable (e.g. *VOLUNTARY* = 1) to untreated observations (*VOLUNTARY* = 0) on one variable, i.e., the propensity score, calculated as probabilities derived from a Probit selection equation (Clatworthy and Peel, 2007; Bernal and Peña, 2011). To do so, we first estimated the propensity scores using the following Probit models:

$$VOLUNTARY_{it} = \alpha + \beta_1 LARGE_{it} + \beta_2 BIG_{it} + \gamma CONTROL + \varepsilon_{it},$$

Differences in
audit pricing

Variable	Exclusion of micro		Below EU SAT		Double exclusion	
	Coefficient	<i>t</i>	Coefficient	<i>t</i>	Coefficient	<i>t</i>
<i>VOLUNTARY</i>	-0.0041	-0.36*	0.0239	1.99**	0.0304	2.44**
<i>LARGE</i>	0.0911	4.81***	0.1111	4.38***	0.1115	4.41***
<i>VOLUNTARY_LARGE</i>	-0.0753	-2.21**	-0.0969	-2.68***	-0.0927	-2.51**
<i>BIG</i>	0.3815	16.58***	0.3239	9.80***	0.3233	9.79***
<i>VOLUNTARY_BIG</i>	-0.0320	-0.75	0.0260	0.57	0.0213	0.46
<i>LN_ASSETS</i>	0.1164	15.51***	0.1278	13.98***	0.1337	13.27***
<i>LN_SALES</i>	0.0964	11.04***	0.1315	11.04***	0.1388	9.69***
<i>LN_EMPLOYEES</i>	0.0602	11.75***	0.0589	8.98***	0.0634	9.11***
<i>INVENTORY_&_RECEIVABLE</i>	0.1506	7.97***	0.2083	8.16***	0.2143	8.13***
<i>ACQUISITIONS</i>	-0.0285	-5.83***	-0.0245	-3.41***	-0.0257	-3.57***
<i>INTANGIBLE_ASSETS</i>	0.2031	2.30**	0.1066	1.01	0.0965	0.90
<i>UNUSUAL</i>	0.0462	1.04	0.1475	2.27**	0.1484	2.29**
<i>SIMPLIFIED_GAAP</i>	-0.0141	-1.92*	-0.0107	-1.10	-0.0117	-1.20
<i>CHANGE_EQUITY</i>	0.0037	0.54	-0.0069	-0.70	-0.0096	-0.95
<i>NUMBER_SUBSIDIARIES</i>	0.0032	0.92	-0.0036	-0.78	-0.0056	-1.22
<i>GROUP</i>	0.0121	1.41	0.0319	2.81***	0.0330	2.86***
<i>SECONDARY_INDUSTRIES</i>	0.0118	3.09***	0.0133	2.71***	0.0129	2.60***
<i>LEVERAGE</i>	-0.0603	-2.80***	-0.0748	-2.72***	-0.0718	-2.53***
<i>CHANGE_LEVERAGE</i>	0.0169	0.48	-0.0200	-0.41	-0.0176	-0.35
<i>GROWTH</i>	-0.0961	-8.55***	-0.1234	-7.04***	-0.1239	-6.45***
<i>ROA</i>	0.1752	2.32**	0.1525	1.52	0.1433	1.41
<i>NEGATIVE_EARNINGS</i>	0.0134	1.66*	0.0207	1.88**	0.0246	2.18**
<i>NEGATIVE_ROA</i>	-0.7389	-6.88***	-0.6201	-4.49***	-0.5993	-4.22***
<i>CURRENT</i>	-0.0047	-1.11	-0.0111	-2.43**	-0.0097	-1.75*
<i>QUICK</i>	0.0072	1.42	0.0155	2.80***	0.0134	2.04**
<i>SOLVENCY</i>	0.0079	0.26	0.0303	0.88	0.0300	0.83
<i>CHANGE_SOLVENCY</i>	0.0057	0.09	0.0544	0.76	0.0570	0.76
<i>AUDITOR_CHANGE</i>	-0.0494	-6.23***	-0.0567	-4.65***	-0.0611	-4.92***
<i>OPT_IN</i>	-0.0445	-6.41***	-0.0540	-6.10***	-0.0549	-6.03***
<i>MODIFIED_REPORT</i>	0.0527	7.33***	0.0639	6.66***	0.0585	6.06***
<i>YEAR_END</i>	-0.0860	-4.98***	-0.1060	-4.08***	-0.1073	-4.12***
<i>CAPITAL_CITY</i>	0.0720	6.46***	0.0711	4.84***	0.0722	4.79***
<i>LN_AGE</i>	-0.0854	-1.89*	-0.1036	-1.71*	-0.0932	-1.49
<i>SQ_LNAGE</i>	0.0250	3.11***	0.0274	2.53**	0.0254	2.26**
Intercept	-0.2424	-0.99	-0.4627	-1.68*	-0.4712	-1.42
<i>n</i>	37,834		16,564		15,914	
<i>F</i>	62.03		33.18		27.57	
<i>R</i> ² (%)	26.56		25.71		23.05	

Notes: This table reports the OLS regression results for the restricted samples. Column 1 reports results excluding micro-companies according to their Spanish GAAP definition. Column 2 reports the OLS regression results for the companies that are below the standard EU SAT. Column 3 reports results excluding both companies above EU SAT and micro-companies. Coefficients of industry and year dummies are not included for parsimony. *, **, ***Significant at 10, 5 and 1 per cent levels, respectively

Table V.
Restricted samples

$$BIG_{it} = \alpha + \gamma CONTROL + \varepsilon_{it},$$

$$MTIER_{it} = \alpha + \gamma CONTROL + \varepsilon_{it},$$

where the dependent variables are *VOLUNTARY*, *BIG* and *MTIER*, and are used to test the differences in the samples after the matching, and the control variables are the same as those used in the OLS regressions[8]. The propensity score obtained from these regressions was used to match treated observations with untreated observations. With regards the

Variable	Voluntary audits		Mandatory audits	
	Coefficient	<i>t</i>	Coefficient	<i>t</i>
<i>LARGE</i>	0.0023	0.08	0.0950	5.01***
<i>BIG</i>	0.3488	9.58***	0.3825	16.58***
<i>LN_ASSETS</i>	0.1378	11.29***	0.1119	13.05***
<i>LN_SALES</i>	0.1408	8.88***	0.0877	8.92***
<i>LN_EMPLOYEES</i>	0.0413	3.64***	0.0592	10.84***
<i>INVENTORY_&_RECEIVABLE</i>	0.2199	5.41***	0.1409	6.98***
<i>ACQUISITIONS</i>	0.0007	0.05	-0.0337	-6.45***
<i>INTANGIBLE_ASSETS</i>	0.1872	1.31	0.2317	2.23**
<i>UNUSUAL</i>	0.1930	1.43	0.0322	0.72
<i>SIMPLIFIED_GAAP</i>	-0.0258	-1.44	-0.0095	-1.21
<i>CHANGE_EQUITY</i>	-0.0101	-0.61	0.0054	0.74
<i>NUMBER_SUBSIDIARIES</i>	0.0015	0.20	0.0043	1.16
<i>GROUP</i>	0.0567	3.03***	0.0039	0.43
<i>SECONDARY_INDUSTRIES</i>	0.0228	2.76***	0.0098	2.41**
<i>LEVERAGE</i>	-0.0491	-1.13	-0.0669	-2.83***
<i>CHANGE_LEVERAGE</i>	-0.1279	-1.68*	0.0405	1.05
<i>GROWTH</i>	-0.1378	-5.53***	-0.0884	-7.17***
<i>ROA</i>	0.4295	2.50**	0.1390	1.71*
<i>NEGATIVE_EARNINGS</i>	0.0409	2.32**	0.0063	0.71
<i>NEGATIVE_ROA</i>	-0.9826	-4.49***	-0.7406	-6.20***
<i>CURRENT</i>	-0.0152	-2.53**	-0.0036	-0.75
<i>QUICK</i>	0.0207	2.90***	0.0059	1.04
<i>SOLVENCY</i>	0.0569	1.38	0.0013	0.03
<i>CHANGE_SOLVENCY</i>	0.0531	0.56	-0.0265	-0.29
<i>AUDITOR_CHANGE</i>	-0.0679	-3.21***	-0.0435	-5.12***
<i>OPT_IN</i>	-0.0313	-2.21**	-0.0447	-5.66***
<i>MODIFIED_REPORT</i>	0.0945	5.31***	0.0489	6.37***
<i>YEAR_END</i>	-0.1425	-3.26***	-0.0754	-4.19***
<i>CAPITAL_CITY</i>	0.0791	3.56***	0.0696	5.77***
<i>LN_AGE</i>	-0.0854	-0.86	-0.1016	-2.10**
<i>SQ_LNAGE</i>	0.0228	1.30	0.0281	3.26***
Intercept	-0.5908	-1.88**	-0.3472	-2.58**
<i>n</i>	5,989		32,497	
<i>F</i>	19.05		50.14	
<i>R</i> ² (%)	29.94		25.00	

Notes: This table reports the OLS results of the regression model, run separately for companies below and above SAT. Column 1 reports results for the companies that are below the Spanish SAT and thus *a priori* voluntarily audited. Column 2 reports results for the companies above SAT and thus mandatorily audited because of size. Coefficients of industry and year dummies are not included for parsimony. *, **, ***Significant at 10, 5 and 1 per cent levels, respectively

Table VI.

Separate analysis of voluntary and mandatory audits

matching algorithm, we employed the nearest neighbour method with a calliper of 0.001 and with no replacement. The nearest neighbour method is the most popular method in the research on accounting and auditing (Clatworthy *et al.*, 2009; Clatworthy and Peel, 2013; Peel, 2014). In this method, each treated observation is matched to an untreated observation with the closest probability within the stipulated calliper, where the calliper represents the maximum difference between the propensity score of the nearest neighbour matched observations (Clatworthy *et al.*, 2009). Finer callipers result in more closely matched observations at the expense of reducing the sample size (Bernal and Peña, 2011). Similarly, the use of replacement can improve the quality of the matching, but the number of different individuals is lower. Therefore, there is a trade-off between the closeness of the matching and the sample size (Clatworthy *et al.*, 2009; Bernal and Peña, 2011).

We performed several tests for each of the variables examined, estimating the propensity scores for different sub-samples. Regarding *VOLUNTARY*, we calculated the propensity score for the total sample, the sub-sample excluding the companies above the standard EU and the sub-sample resulting from the double exclusion (micro-companies and those above standard EU SAT), and tested differences between voluntary and mandatory audits. In order to test the Middle-Tier auditors' premium, we excluded Big 4 auditors from the test, and renamed *LARGE* as *MTIER* to avoid confusion. Furthermore, we carried out two additional analyses with *BIG* and *MTIER* using samples restricted to voluntary audits (i.e. companies below SAT). Table VII reports the results of the PSM for the test variables. Unreported tests show that covariates are well balanced, so the matching was effective in building a good control group, controlling for potential endogeneity problems.

Regarding *VOLUNTARY*, we can see that, although the differences between the treated group (voluntary audits) and the untreated one (mandatory audits) are negative before the matching, these differences become positive after applying the PSM. These results, which support those obtained in Section 4.2, suggest that voluntary audits, when compared with similar cases of mandatory audits, are charged with a premium. The results are robust in the three tests, and are more significant when we consider the double exclusion, which improves the comparability between voluntary and mandatory audits.

With regard to *BIG*, we can see that the differences before PSM remain after the matching, and are in line with those reported before. The differences are persistent when we use the sample of voluntary audits. Finally, in the case of Middle-Tier auditors we can see that, although differences remain after applying PSM in the full sample, these differences disappear in the sample of voluntary audits. Therefore, these results are in line with those obtained in Sections 4.1 and 4.2 and show that the Middle-Tier auditors' premium is not significant in the voluntary setting.

Variable	Sample (observations)	Treated (variable = 1)	Controls (Variable = 0)	Difference	SE	t-stat
<i>VOLUNTARY</i>	Unmatched (38,486)	1.8173	2.0425	-0.2252	0.0059	-38.02***
	ATT (5,018)	1.9443	1.9153	0.0290	0.0117	2.48***
<i>VOLUNTARY</i> (Below EU SAT)	Unmatched (16,564)	1.8173	1.9518	-0.1345	0.0067	-19.96***
	ATT (3,846)	1.9386	1.9104	0.0282	0.0134	2.11**
<i>VOLUNTARY</i> (Double exclusion)	Unmatched (15,914)	1.8552	1.9520	-0.0968	0.0069	-14.05***
	ATT (3,842)	1.9441	1.9107	0.0334	0.0135	2.48***
<i>BIG</i>	Unmatched (38,846)	2.4063	1.9483	0.4580	0.0061	75.22***
	ATT (9,620)	2.4052	1.9656	0.4396	0.0095	46.31***
<i>BIG</i> (Below SAT)	Unmatched (5,989)	2.1143	1.7486	0.3658	0.0146	25.14***
	ATT (2,034)	2.1090	1.7609	0.3480	0.0216	16.13***
<i>MTIER</i>	Unmatched (33,513)	2.0312	1.9440	0.0872	0.0095	9.17***
	ATT (3,292)	2.0318	1.9635	0.0683	0.0140	4.88***
<i>MTIER</i> (Below SAT)	Unmatched (4,863)	1.7725	1.7467	0.0259	0.0227	1.14
	ATT (680)	1.7595	1.7781	-0.0186	0.0311	-0.60

Notes: This table reports the sample means of *LN_FEES* by the test variables (*VOL*, *BIG* and *MTIER*) in the unmatched sample and in a sample matched by propensity score matching. Number of observations is reported in parentheses. "Below EU SAT" refers to the sample resulting from the exclusion of the companies that are above standard EU SAT to be mandatorily audited; "Double exclusion" refers to the sample resulting from the exclusion of: the companies that are above standard EU SAT to be mandatorily audited; and micro-companies considering their definition in the Spanish GAAP; "Below SAT" refers to the sample of companies below SAT (and thus *a priori* voluntarily audited). *, **, ***Significant at 10, 5 and 1 per cent levels, respectively

Table VII.
Summary of
PSM results

5. Discussion of results

Globally, the results support the idea that voluntary audits are charged with a premium, which is not charged for mandatory audits. Although the preliminary analysis does not report significant differences between voluntary and mandatory audits, the additional analysis using restricted (and thus more comparable) samples and the PSM results show this premium among voluntary audits. Therefore, these results support the hypothesis that the pricing for voluntary and mandatory audits is different. The potential explanation for this premium relies on the signalling value of price among credence goods: the only way to indicate higher audit quality is via prices, thus companies have to pay a premium in order to show they have a true commitment with accounting quality. In contrast, “passively compliant” companies from the mandatory setting will choose to be audited by “low-cost” auditors, because they are only interested in fulfilling the legal requirements.

On the other hand, the Big 4 premium is persistent across the analyses, while the Middle-Tier premium observed among mandatory audits disappears in the voluntary setting. These results indicate that Big 4 auditors maintain their price policies among small companies, which suggests that they are not willing to offer different prices depending on the market segment. A possible explanation for this is that Big 4 auditors may be concerned about the effect that different price policies can have on their audit quality reputation, having collateral effects on their main market segments (public and large companies). In contrast, Middle-Tier auditors are apparently willing to reduce their premium, as such audit firms may have a greater interest in accessing the SME market, and more specifically voluntary audits, because of their growth opportunities in this market segment. Therefore, Middle-Tier auditors may follow a different competitive strategy when auditing smaller companies, competing via prices.

Taken together, we can differentiate three groups of auditors with different strategies in the voluntary setting: first, small auditors charge a premium when carrying out voluntary audits, because audited companies are aware that price is an indicator of higher commitment with accounting quality compared to mandatory audits, which are related to “passively compliant” firms that seek out the “low-cost” option. Second, the Middle-Tier auditors, who charge a premium among large private companies (Boone *et al.*, 2010; Sundgren and Svanström, 2013), are willing to reduce this premium in order to gain market share in the market segment of voluntary audits. Finally, Big 4 auditors do not vary the premium they charge, and thus they follow a purely competitive strategy, linking their higher price to high-quality services (Chaney *et al.*, 2004; Hope and Langli, 2010; Hope *et al.*, 2012).

6. Conclusions

In the present paper, we have tackled the lack of research into the differences in audit fees between voluntary and mandatory audits. Based on the theory that prices have a signalling effect on credence goods, we argue that voluntarily audited companies may be charged with a premium, that is not charged for mandatory audits, in order to signal their commitment to accounting quality. Using a sample of Spanish SMEs, we empirically examine whether the pricing for voluntary audits is different to mandatory audits. We also examine whether the Big 4 premium observed in previous literature remains among SMEs, especially for voluntary audits. Furthermore, we consider the role of Middle-Tier auditors (Peel and Roberts, 2003; Clatworthy and Peel, 2007; Sundgren and Svanström, 2013).

Although initially we did not find significant differences between voluntary and mandatory audits, the additional tests controlling for the comparability of firm size and using the PSM methodology showed that there is a premium for voluntary audits, which

we associate with the signalling effect of prices on the quality of voluntary audits, in contrast to “passively compliant” companies which are required to be audited and choose “low-cost” audits regardless of their quality. With regard to large auditors, we find a Big 4 premium in both the voluntary and mandatory settings, while the premium associated with Middle-Tier auditors is not significant in the voluntary setting. These results suggest that, while Big 4 auditors may be concerned about the effect that different price policies can have on their audit quality reputation, Middle-Tier auditors are willing to follow a different competitive strategy for voluntary audits, in order to gain access to this market segment.

These findings have several implications on audit quality: first, since voluntary and mandatory audits are priced differently, auditors may perform such audits differently, thereby generating contrasting levels of audit quality, with more “good” voluntary audits and “bad” mandatory audits. Second, since Middle-Tier auditors reduce their premium for voluntary audits, whether the audit quality of Middle-Tier auditors remains unchanged or is jeopardised by the lower fees remains an open question. Another related issue is how audit quality affects Middle-Tier auditors’ reputation: as an unintended consequence, they may be damaging their reputation by competing in price in the voluntary setting, instead of following a strategy consequent with that used among large companies. Finally, since Big 4 auditors continue to charge higher fees in the voluntary setting, the question is whether they also conduct higher quality audits in this market segment.

This study presents a number of limitations. First, although we have considered that companies below SAT are voluntarily audited, some companies can be subject to mandatory audits. Since we do not have any information about the reason they are being audited, we cannot ensure that these companies are actually audited on a voluntary basis. On the other hand, the mixed results for the Middle-Tier auditors need a more-in depth study of the premium related to them.

The paper presents several opportunities for future research. First, since we have found significant differences between voluntary and mandatory audits, it would be appropriate to examine whether the audit quality across these settings is also different. Second, Middle-Tier auditors could be measured in a different way in order to analyse whether more companies should be included in this group. Finally, the results for both groups of large auditors should be complemented with the other effects that they cause, such as the improvement of the companies’ credibility, or the actual quality of the audits provided by them.

Notes

1. Big 4, BDO and Grand Thornton. These latter two firms are usually considered the Middle-Tier auditors.
2. The Directive states the obligation for limited liability companies to be audited, with the exception of small firms, defined as the companies which on their balance sheet dates do not exceed the limits of at least two criteria: €4,000,000 for total assets, €8,000,000 for the net turnover and 50 employees. Member States can define higher thresholds for total assets (up to €6,000,000) and turnover (up to €12,000,000).
3. Companies must meet the thresholds for two consecutive years. Therefore, companies that do not satisfy these criteria cannot be classified as required (or not) to be audited.
4. *Instituto de Censores Jurados de Cuentas*.
5. Total assets of €4,000,000, turnover of €8,000,000 and 50 employees.

6. Companies that do not meet two out of: €1,000,000 in total assets; €2,000,000 in net turnover; and 10 employees.
7. Since we separately examine voluntary and mandatory audits, *VOLUNTARY* and its interactions with *LARGE* and *BIG* are excluded from the Model.
8. Industry dummies were excluded from the Probit regressions because preliminary analyses showed that they were not significant.

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