Implementing mandatory audit firm rotation: Effects on audit and non-audit fees

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ABSTRACT

The 2014 reform of the European Union (EU) regulation on auditing includes mandatory audit firm rotation and a significant limitation of the provision of non-audit services by the audit firm to their existing clients. This paper analyses the changes in audit fees, and non-audit fees, as well as in their proportion, when there is a switch of audit firms, before and after the new regulation. The analysis is carried out for the Spanish listed companies from 2011 to 2018 using two types of analyses, descriptive/comparative and multivariate, panel data, regressions. As expected, the new EU regulation has resulted in a significant increase in audit firm switches. The results show that, when there is a change of audit firm, the incoming firm offers a significant discount to the new client with the outgoing firm. This is the case before and after the reform, and for both voluntary and mandatory switches after the reform. In addition, the reform has led to a reduction of non-audit fees, which is especially evident after a voluntary audit firm switch. We conclude that audit firms seem to be willing to take on the additional cost of auditing a new company to gain clients.

Implementación de la rotación obligatoria de firma de auditoria: Efectos en los honorarios de auditoria y honorarios por otros servicios distintos de auditoria

RESUMEN

La reforma de la normativa de la Unión Europea sobre auditoria de 2014 incluye la rotación obligatoria de la firma de auditoría y una importante limitación de trabajos distintos de auditoria por parte del auditor. Este trabajo analiza los cambios en los honorarios de auditoría, honorarios por otros servicios, así como la proporción entre ambos, cuando se produce un cambio de firma de auditoría, antes y tras la nueva normativa europea. El análisis se realiza para las entidades cotizadas en España durante los años 2011 a 2018 mediante de dos tipos de análisis, descriptivo/estadísticos y de regresiones de datos panel. La nueva regulación ha supuesto un aumento en los cambios de firmas de auditoría. Los resultados muestran que, cuando hay un cambio de firma de auditoría, la firma entrante ofrece un descuento significativo al nuevo cliente en comparación con la firma saliente. Esto es así antes y después de la reforma y, en este último caso, tanto para cambios voluntarios como obligatorios tras la misma. La reforma ha supuesto una reducción de los honorarios por servicios distintos de auditoría, que se manifiesta especialmente después de un cambio voluntario de firma de auditoría tras la reforma. Las firmas de auditoría parecen dispuestas a asumir el coste adicional de auditar a una nueva empresa con el objetivo de ganar clientes.

1. Introduction

The global financial crisis (GFC) in 2007-2009 and several financial scandals and corporate collapses globally since then (for example, Northern Rock, Royal Bank of Scotland and Carillion in the UK, Lehman Brothers and Fannie Mae in the USA, Nortel in Canada, ABN-Amro in the Netherlands and Pescanova in Spain, among others) have directly questioned the (lack of) quality of auditors' work. As a result, the European Union's (EU) direct response to the GFC was the enactment of a new Audit Regulation, EU 537/2014, and a new Audit Directive 2014/56/EU in 2014, with an effective date of 17th June 2016, aiming at enhancing the audit quality and assurance of financial statements of listed companies in the EU. The reforms in the new EU regulation have included mandatory audit firm rotation, a severe limitation on the provision of non-audit services by the incumbent audit firm to its existing clients and a cap on total audit fees received. According to the EU, the overall aim of the new regulation is to address the perceived familiarity and economic bonding between the audit firm and the client company, as well as to reduce the dominance of the Big-4 audit firms (Horton et al., 2018).

During the last decade, a significant number of Spanish-listed companies, including the biggest listed companies in terms of market capitalisation, as reported in more detail below, have changed their incumbent audit firm. The effect of these audit firm changes, mainly voluntary but some compulsory after the effective date of the EU regulation in 2016, has resulted in Spain, as well as in other EU countries, in a significant change of the audit context and, therefore, we argue it warranties further evaluation. The market for audit services can potentially change as result of the EU audit regulation, and we examine in this research the impact of those audit reforms in the EU. Specifically, we are interested in examining the Spanish audit market. Gómez-Aguilar et al. (2018) have examined, for the 1998-2010 period, the issue of audit partner and firm rotation in Spain and argue that the implementation of audit firm rotation is most likely to impose high-cost safeguard measures, such as the impairment of the knowledge of auditors on their clients or the increase of audit fees to compensate for the additional work during the first years of the new auditing engagements, without necessarily having a positive effect on audit quality. However, their analysis was conducted in a non-mandatory rotation context, so further research is needed.

This paper focuses on the 537/2014 EU regulation and its effects on audit and non-audit fees, giving particular attention to the clause of the new law that relates to audit firm rotation. We also analyse the effect of the audit firm changes on auditors' fees for their legal assurance work (audit fees, AF) and other non-audit services (non-audit fees, NAF) before and after the implementation of the 2014 EU regulation in Spain. The analysis of auditor's fees also provides us with the opportunity to determine the overall pattern in the NAF/AF ratio, which is a matter of concern for regulators because the provision of non-audit services appears to diminish the perception of auditor independence (Canning & Gwilliam, 1999; Krishnan et al., 2005; Dart, 2011).

Our research provides several contributions to the academic literature. First, it provides important knowledge on the evolution of audit fees, both overall for all engagements and specifically for new engagements after the latest, more restrictive, EU regulation of 2014. Second, in a similar vein, it shows the evolution of non-audit fees and the NAF/AF ratio in this new context. Third, it extends these analyses differ-

entiating between mandatory and voluntary audit firm rotations after the reform. The empirical results of this research can be of interest to the rest of the EU countries and internationally.

We conduct two main analyses in this research. First, descriptive and comparative analyses emanated by all audit firm changes, including both financial and non-financial firms, occurred before, that is in the 2011-2014 period, and after the approval of the regulation, that is in the 2015-18 period, to observe the direct effect of the reform on the Spanish audit market. Second, only for the non-financial firms[1], we carry out multivariate, panel data, analyses to control for different audit firm switch-related aspects and organisational features of the auditees. Despite the significant academic literature devoted to audit firm rotation and audit fees, the impact of the introduction and enforcement of a mandatory audit firm rotation regulation on audit and non-audit fees needs to be studied in greater detail. In the Spanish case, Guzmán-Raja et al. (2021) analyse audit quality and audit fees in Spain from 2013-2018, but they do not analyse either the possible effects of the regulatory change on audit fees or the evolution of non-audit fees and the NAF/AF relationship due to the new regulation. Garcia-Blandon et al. (2021) study the 537/2014 regulation in Spain, but conduct their empirical analyses before its actual enforcement. Our company sample is more complete and drawn from the listed companies of the Spanish Continuous market in Madrid, *Mercado Continuo*, Bolsa de Madrid[2].

Our results show that audit firms offer a significant fee discount in the first year of engagement in the whole period of our investigation (i.e., in 2011-2018), despite the need for more audit effort and higher audit costs in the presence of an audit firm switch (Bell et al., 2015). In the post-reform period, after controlling for auditee characteristics, the initial discount continues in the second and third year of engagement which is consistent with a lowballing practice but also with the need for less audit effort after gaining auditee knowledge. We also find that the 2014 EU reform has resulted in a significant reduction of non-audit services. In addition, we document that the switch of an audit firm is associated with a significant reduction of NAF in absolute terms, as well as in proportion to AF, for voluntary firm rotations. The NAF reduction continues in the second and third years of the engagement. Our results highlight that auditors cannot use the provision of non-audit services as a strategy to compensate for initial audit fee discounts.

Our findings can also be helpful to EU regulators when the anticipated review of the effects of the recent EU regulation will take place shortly. Such documented lowballing effect in Spain, which is noticeable before and after the 2014 EU law enactment, allows us to make direct references to a perception concern for audit quality in Spain. Further, the pattern shown in our research of the continuous NAF reduction after the EU audit reforms addresses one of the ongoing issues highlighted in previous years by regulators and other stakeholders and was related to the perceived impairment of auditor independence by the provision of non-audit services by the incumbent external auditor.

The paper is structured as follows. Section 2 explains the

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[1] Financial firms are usually excluded from this type of analysis due to their specific characteristics (e.g., Carmona et al., 2011; Corbella et al., 2015; Cho et al., 2021).

[2] In this paper, we do not include data from the secondary market in Spain, such as Latibex, MARF or MAB (now BME growth), as these are small markets with specific characteristics, with a special set of regulations designed specifically for them, and with costs and processes tailored to their characteristics.

main aspects of the 537/2014 EU reform and presents the audit context in Spain. Section 3 reviews the academic literature about audit firm rotation regarding audit quality and audit fees and proposes the research statements to be tested. Section 4 is devoted to the research design and explains the sample and the methodology used. Section 5 presents our results. Section 6 discusses the results and conclusions are drawn in Section 7.

2. The Spanish audit context

Spain is the fourth biggest economy of the EU-27 countries, and approved a mandatory audit firm legislation in 1988, but was overruled in 1995 before a single mandatory audit firm rotation took place (Carrera et al., 2007). Therefore, Spain has had no mandatory audit firm rotation regulation until the enforcement of the 537/2014 EU regulation. The Spanish regulatory audit context is very much influenced by its participation within the EU bloc. Before the enactment of the 2014 regulation, the EU countries based their national audit laws on the Statutory Audit Directive 2006/43/EC, which set an overall framework for auditing. According to this directive, audit firm rotation was optional, whereas audit partner rotation was compulsory for every five to seven years, with a two-year cooling-off period (Horton et al., 2018)[3]. Spain opted for a seven-year audit partner rotation, like Germany, in contrast to the five years in the UK or the 6 years in France (Garcia-Blandon & Argilés-Bosch, 2013a). Table 1 shows the audit framework in some EU countries before the 537/2014 EU regulation. As can be seen in Table 1, the adaptation of the 2006 Directive into national laws regarding audit firm rotation, ban on non-audit services and total fee cap set, created substantial unstandardised regulatory contexts within the EU bloc.

Table 1. Audit regulation in some EU countries <u>before</u> the EU 527/2014 regulation

Country	Audit firm rotation	Ban of non-audit services	Total fee cap
Austria	No	Partial	Yes
Belgium	No	Full	Yes
Czech Republic	No	Partial[(1)]	No
Denmark	No	Partial[(1)]	Yes
Finland	No	Partial[(1)]	No
France	No	Full	No
Germany	No	Partial	Yes
Greece	No	Partial[(1)]	No
Ireland	No	Partial	Yes
Italy	Yes	Partial	No
Netherlands	Yes[(2)]	Partial[(1)]	No
Norway	No	Partial	No
Poland	No	Partial	No
Portugal	No	Partial	No
Spain	Yes[(3)]	Partial[(1)]	No
Sweden	No	Partial[(1)]	No
UK	No	Partial	Yes

Adapted from Horton et al. (2018)
[(1)] Horton et al. (2018) indicate No for these countries, but the 2006 EU Directive imposed limitations to the provision of non-audit services in the EU countries.
[(2)] Approved in 2012 but not enforced and subsequently aligned with the new 2014 EU legislation after its approval.
[(3)] Approved in 1988, abolished in 1995, and enforced after the implementation of the new 2014 EU legislation.

Table 1 allocates Spain in the group of countries with a more favourable, less strict, context for the audit firms in the period before the 2014 EU regulation, with no audit firm rotation, a less severe limitation of non-audit services and no cap on fees. The favourable context for the audit firms in Spain was also 'blessed' with the existence of low litigation risk in the country (Garcia-Blandon & Argilés-Bosch, 2013a). The low litigation risk context in Spain did not result in significantly lower levels of audit quality associated with either the provision of non-audit services or long audit tenures (Garcia-Blandon et al., 2017).

All the favourable conditions in the Spanish audit market dramatically changed during the second half of the 2010 decade for two main reasons, namely, the enactment of the 537/2014 EU regulation and the audit scandals that have occurred in Spain. Each EU country has the option of adapting the regulation to their specific national regulatory context within the overall EU framework[4]. The main aspects of the 2014 audit reform include mandatory audit firm rotation, a ban on many non-audit services, as well as a limitation on fees received for those allowed (70% cap of audit fees based on a 3-year average), and a cap on total fees of the auditors (Horton et al., 2018). As for mandatory rotation, the new regulation also enacts a maximum tenure of ten years with the same audit firm as the general rule, with ten additional years if tenders are carried out, and 14 additional years in case of joint audits (Horton et al., 2018). The promulgated partner rotation remains mandatory after the seventh engagement year. Both, firm and partner rotation periods can be shortened by individual EU Member States.

Spain is one of the countries that have adopted a strict implementation of the new mandatory audit firm rotation provision (Willekens et al., 2019). In terms of mandatory audit firm rotation, Spain has opted for shorter additional periods than those allowed by the 2014 EU regulation, allowing a joint audit extension of four years over the initial ten years. The provision of certain non-audit services, namely, the preparation of tax forms, the identification of public subsidies and tax incentives, and the provision of tax advice, are allowed in Spain after the 2014 audit reforms, like other EU countries, such as Austria, Germany, Denmark and Ireland (Aschauer & Quick, 2018). Spanish-listed firms report relatively low levels of non-audit services related to tax issues provided by the main audit firm after the implementation of the 2014 EU regulation, which signals significant independence of audit firms to their clients (Garcia-Blandon et al., 2021). According to Cabal-Garcia et al. (2019), none of the previous reforms of the auditing legislation (in 2002, 2010 and 2015) have resulted in improved financial reporting quality in Spain. Voluntary audit firm rotation in Spain has not affected the quality of the audit work, so the new reform may result in significant costs for those involved, such as reducing the knowledge that auditors have about their clients (Gómez-Aguilar et al., 2018).

One intended goal of the 2014 EU regulation was to increase competition in the European audit market (Horton et al., 2018). International studies on the audit market show a high level of concentration, with Big-4 firms dominating the markets (e.g., Ballas & Fafaliou, 2008; Willekens et al., 2019). Spain was one of the EU countries with a high audit market concentration for listed companies before the GFC (see Ballas & Fafaliou, 2008). The Big-4 dominance has been constantly reported in the academic literature for Spanish-

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[3] According to Horton et al. (2018), only Italy had enforced audit firm rotation before the new 2014 EU legislation.

[4] The document produced by one of the Big-4 audit firms, Ernst & Young, and titled "EU audit legislation, FAQs – 7 April 2015", makes a subtle exposition of the reforms.

listed companies before the GFC (see e.g. Nieves-Carrera et al., 2005; Carmona & Momparler, 2011) and after the GFC (e.g. Cabal-Garcia et al., 2019, Garcia-Blandon et al., 2021), with around 85% of listed companies having a Big-4 auditor during the last decade of the 20th century and the first two decades of the 21st century. Despite this market concentration, leading firms do not use their market power, and competition between firms is based on reputation differences which results in higher fees (Rodriguez-Castro et al., 2017). However, the GFC has had an impact on the audit market, because, according to the annual reports disclosed by the ICAC (2011-2017) during the years after this crisis, the average fees per hour reported for audit firms had a significant downward trend from € 70.81 per hour in 2011 to € 65,42 per hour in 2017[5], which is an aggregate reduction of almost 8 per cent.

The new EU audit regulation as implemented in Spain sets that audit fees must be settled before the beginning of the audit engagement and for the whole period of the agreement. Such fees shall not be contingent fees and shall not be influenced or linked to additional services or contingent services. As stated before, in addition to a severe limitation of the provision of non-audit services, the new EU regulation in Spain imposed a NAF limitation of 70% cap on audit fees based on a 3-year average.

3. Audit firm rotation and research statements development

Audit firm rotation and lead audit partner rotation have been the focus of academic research for years (see, for example, Comunale and Sexton, 2005; Huang et al., 2009; Jenkins & Velury, 2012; Daugherty et al., 2013, Desir et al., 2014; Lennox et al., 2014; Corbella et al., 2015; Cho et al., 2021). Whereas lead audit partner rotation has been enforced in the EU since the implementation of the 2006/43/EC Directive, very few countries had effectively imposed audit firm rotation, with Italy being the only EU country before the 537/2014 EU legislation (see Table 1). Corbella et al. (2015) provide two arguments in favour of audit firm rotation over partner rotation. On the one hand, a new partner from a new audit firm may be more willing to contradict judgments made by the predecessor auditor. On the other hand, audit firms are aware that their judgments will be reviewed by another audit firm in a predetermined period. These authors conclude that, presumably, either of these circumstances can lead to improved audit quality. Arguments against audit firm rotation include (see, for example, Comunale and Sexton, 2005; Jenkins & Velury, 2012; Daugherty et al., 2013) the loss of client-specific audit knowledge and experience which may lead to reduced audit quality.

One of the main objectives of mandatory rotation is to limit audit firm tenure, but the results of the empirical studies on the relationship between audit quality and audit tenure are rather inconclusive. According to Johnson & OKeefe (2015), mandatory audit firm rotation would likely increase competition among auditors and possibly impair audit quality by promoting lowballing and opinion shopping. In the Spanish context, several studies find that longer audit tenure is related to a worsening of audit quality (e.g., González-Díaz et al., 2015; Garcia-Blandon & Argilés, 2015), but other studies conclude that audit firm tenure does not harm audit qual-

ity (see e.g., Garcia-Blandon & Argilés-Bosch, 2013b; Garcia-Blandon et al., 2017; Gómez-Aguilar et al., 2018). Internationally, studies have found that longer tenure improves audit quality (Chen et al., 2008; Bell et al., 2015). For the Italian case, where audit firm rotation has been mandatory since 1975, Cameran et al. (2015) find that audit quality is lower during the first three years of engagement and higher the later years of auditor tenure. Corbella et al. (2015) find that audit quality improves following an audit firm rotation, both mandatory and voluntary, but only for companies audited by non-Big 4 firms. The focus of this study is on the effect of the introduction of a mandatory audit firm rotation on audit and non-audit fees in Spain, and the academic literature on the issue is now presented in more detail.

3.1. Audit fees (AF), audit effort and costs

It is expected that engaging a new auditor would normally result in additional work for the audit firm. New auditors would include additional effort in their first audit plan to reduce the information asymmetry and the lack of specific business understanding that they face in directing the first-time audit (Bedard & Johnstone, 2010; Farag & Elias, 2011; Bell et al., 2015). Therefore, to maintain the required standard of audit quality, when rotation occurs, incoming auditors would need to increase their costs, which should be passed on, fully or partially, to the auditee.

Focusing on the effect of audit firm rotation on audit fees, the lowballing effect has been widely reported in the literature for both non-mandatory and mandatory audit contexts. For non-mandatory context, different studies confirm lowballing practices with a reduction of the initial discount in the following years (Gregory & Collier, 1996; Ghosh & Lustgarten, 2010; Huang et al., 2009; Desir et al., 2014, Bell et al., 2015; Johnson & OKeefe 2015). Ghosh & Siriviriyakul (2018) find that audit fees increase with firm tenure because clients grow, on average, over time and because of a fee premium that is directly linked to tenure. They also note that the related reduction of the audit report lag over time suggests that audit engagements become more profitable over time. After having issued an audit fee discount in the initial audit engagement, the incoming auditor may be able to revert this situation and, even in the following years, audit fees normally exceed the initial fee discount of the first year (Craswell & Francis, 1999; Cho et al., 2021). Studies on the Italian mandatory audit rotation context also report a lowballing effect (Cameran et al., 2015; Corbella et al., 2015). The results of Corbella et al. (2015) confirm this lowballing effect, but only for companies audited by a Big-4 firm. Cameran et al. (2015) convey an average 16 per cent audit fee discount in the first year of an audit engagement, despite reporting abnormally higher engagement hours in the first year. These authors also report a reversion, or reduction, of the initial discount because longer tenure results in higher fees. However, this reversion is evident after several years of the audit engagement because the initial discount continues during the second and third years of the engagement. In addition, they also report an opportunistic behaviour of the outgoing audit firm, which significantly increases its fees in the last year of the engagement.

The main concern about the reported lowballing practice in the tendering process for a new audit engagement is that audit fees (AF) are a proxy measure for audit effort as well as audit risk. Holding audit risk constant, the auditor could potentially reduce the audit effort to minimise the loss on the engagement, risking however a reduction in audit quality

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[5] The ICAC publishes an annual report about the state of affairs of the audit market in Spain. Average fees per hour were not disclosed for the 2018 report and subsequent years.

(Chen et al., 2018). However, lower initial fees are not necessarily associated with lower quality levels because market-based incentives (avoiding lawsuits and preserving reputation) can motivate auditors to uphold audit quality (Cho et al., 2021). In Spain, audit quality has not declined despite the fall in audit fees after the GFC (Climent-Serrano et al., 2018). Therefore, in a context of increasing competition and with literature supporting the lowballing effect, we posit our first research statement (RS1):

> *Research Statement RS1*: *An audit firm switch in Spain results in opportunistic behaviour from the incoming audit firm, that is, a discount audit fee effect would be observed.*

Given the prior literature discussed above, RS1 is assumed for audit firm changes occurred both in the 2011-14 period, i.e. before the 2014 EU reforms, and in the 2015-18 period, i.e. after the EU reforms. Following prior literature, we develop two further propositions and we posit that there is an increase in AF the last year of the outgoing auditor (*P1i*). We also expect an increase in AF after the first year of the audit engagement (*P1ii*), because the incumbent audit firm tries to revert the initial discount. Therefore, the following two propositions are formulated:

> *P1i*: *An increase in AF is observed in the last year of the outgoing audit firm engagement.*

> *P1ii*: *An increase in AF is observed after the first year of the incoming audit firm engagement.*

3.2. Non-audit fees (NAF) and perceived auditor independence

The new 2014 EU regulation also limits the portfolio of non-audit services that can be offered by external auditors to their clients. In addition, it has regulated the fees received from these services, intending to enhance the independence of the statutory auditor. However, the literature discusses two issues regarding auditor independence: "independence in appearance" or "perceived independence", and "independence in fact" or "real independence" (Anandarajan et al., 2012; Ratzinger-Sakel & Schönberger, 2015). The prior academic literature is inconclusive about the effect of the provision of non-audit services on auditor's real independence and audit quality. On the one hand, studies find that the provision of these services to audit clients enables auditors to obtain a more detailed knowledge of the clients and their business, systems, risks and personnel. Such increased knowledge, then, creates spillovers that improve audit quality (see e.g. Antle et al., 2006; Krishnan & Visvanathan, 2011, Krishnan & Yu, 2011; Bell et al., 2015; Carmona et al., 2015). On the other hand, studies find that the provision of these services reduces audit quality as it creates a cosy relationship between auditors and their clients (e.g. Basioudis et al., 2008; Habib, 2012; Hossain, 2013; Causholli et al., 2015; Legoria et al., 2017). Firth (2002) shows that the level of non-audit services is, in part, a function of specific events that require additional auditing, providing some support for the knowledge spillovers. Once these specific events, such as mergers or restructures, among others, are controlled, there is no dependence between audit and non-audit, consultancy, or fees.

By banning the provision of some non-audit services as introduced by the EU reform in 2014, the regulators intended to enhance the perceived auditor independence and, thus, the public trust in audited financial statements. Therefore, in the context of a more restricted regulation and of increasing litigation risk in Spain due to the reform, where the provision of non-audit services is seen as a reduction of auditor independence, we draw the following research statement (RS2):

> *Research Statement RS2*: *There is a significant reduction in the fees of non-audit services charged, and in the non-audit fee to audit fee ratio, after an audit firm switch, especially after the EU 2014 regulation passing.*

We examine whether there is any descriptive evidence in 2015-18 period arising from audit firm switches in this period in comparison to the direct previous period of 2011-14. Moving forward, we also investigate two related propositions to *RS2* above. First, we examine whether there is a significant difference in NAF, and in the NAF/AF ratio, between the second last year and the last year of the outgoing audit firm (*P2i*). Knowing that a client switch is eminent, an auditor may be more concerned about perceived auditor independence, and there may be no increase in NAF, or in the NAF/AF ratio. Second, we posit that there is no significant difference in NAF and NAF/AF ratio between the first year and the second year of the audit engagement of the new incoming audit firm (*P2ii*). During the tendering process after the new regulation, the provision of non-audit services would have been set to a level that perceived independence is ensured from the first year of engagement, so no further reductions in NAF may be needed or expected. Thus, we formulate the following research propositions:

> *P2i*: *Outgoing auditors may be concerned more about perceived auditor independence in the last year of an audit term, and therefore, no increase in NAF, or the NAF/AF ratio, is expected.*

> *P2ii*: *Perceived auditor independence may increase because of the new EU regulation, and therefore, no increase in NAF, or in the NAF/AF ratio, is expected after the initial audit engagement.*

4. Research design: sample and methodology

Our initial sample is made up of all listed companies in the main Stock Exchange Market in Spain, the '*Mercado continuo*', quoting at the end of each financial year from 2011 to 2018. The list of companies has been obtained from the capitalisation ranking made by *BME*[6] for the listed companies in the Spanish Continuous Market (SIBE) on 31 December for the years 2011 to 2018. The ranking does not include foreign corporations and the MAB companies. Information about audit fees, non-audit fees and the name of the audit firm has been manually obtained from the companies' consolidated financial statements downloaded from the *Comisión Nacional del Mercado de Valores* (*CNMV*). The *CNMV* is the Spanish equivalent of the Securities and Exchange Commission in the U.S. and of the Financial Reporting Council in the U.K. Balance Sheet and Income Statement figures have been obtained from the ORBIS database maintained by Bureau Van Dijk.

The first analysis focuses on audit firm switches that occurred among the financial and non-financial listed companies in our sample and investigates the effect of the new 2014 EU audit regulation in the market for audit services in Spain.

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[6] *Bolsas y Mercados Españoles* (BME) manages the listed market in Spain the '*Mercado continuo*' and the market for small companies listing in the MAB market (the equivalent to the London AIM market).

The initial sample for this analysis is 909 company/year observations. In this period, 65 Spanish-listed companies changed their audit firm at least once. Eleven of the listed companies changed their audit firm twice in the period of investigation, which resulted in a total of 76 audit firm switches during the whole period.[7] Table 2 shows the number of audit firm switches by year, including mandatory ones (in parentheses) after the enforcement of the new regulation. The end of the financial year for most of the Spanish-listed companies in Spain is 31st December, so mandatory audit firm rotation started in 2017. In addition to these switches, four listed companies (*AMREST, Pescanova, Solarpack* and *Vertice Trescientos Sesenta Grados)* changed audit firms, but they were not quoting at the end of the year before and/or after the change. Two firms moved to a joint audit (*Compañía de Distribución Logística* and *Técnicas Reunidas)* in 2017, so they have not been included in our analyses.

Table 2. Number of audit firm switches per year among Spanish listed, including financial and non-financial, companies in 2011-2018.

	Audit firm changes
2011	7
2012	9
2013	4
2014	5
2015	11
2016	8
2017	21 (11)*
2018	11 (2)*

* Between parentheses, mandatory rotation according to our projections.

The EU reforms came into real effect for all members of the EU in June 2016. However, it can be said that the new regulation has potentially influenced audit firm rotation processes, voluntarily, straight after its enactment in 2014, as the new rule on compulsory auditor rotation was not compulsory until the year 2017 in Spain. As can be seen in Table 2, thirty-two auditor changes occurred in 2017 and 2018, of which nineteen were voluntary and thirteen compulsory. Conversely, it can be argued that our various analyses and deductions for the 2015-18 period may underestimate the possible effects on perceived auditor independence, as the full force of the law has started having an impact in the middle of our second sample period (i.e., the years of 2017 and 2018).

4.1. First-step analyses. Descriptive and Wilcoxon-related pair tests

In our first analyses, we conduct descriptive statistics and Wilcoxon related-pair (signed-rank) tests to compare auditor fees, as explained further below, between different years surrounding the auditor change in the Spanish-listed companies during the period 2011-2018. We have conducted Wilcoxon tests, instead of T-tests, due to the relatively low number of cases included in the analyses, and because normality is not required. To test our research statements and propositions, different explanatory comparisons are made between three short-term, one-year, periods, as follows:

- Firstly, between the last year of the outgoing auditor and the first year of the incoming auditor (LastY-1stY), that is the year of change.

- Secondly, the change between the first and the second year of engagement of the new audit firm (1stY-2ndY).

[7] The Annex shows the complete list and information of the companies that switched audit firm in 2011-2018.

- Thirdly, between the second last and last year of engagement of the outgoing audit firm (2ndLastY-LastY).

The inclusion of the LastY-1stY comparison allows us to directly observe whether there is presence of a lowballing effect and a possible increase or decrease in the perceived independence of the new auditor in the Spanish market. The number of listed companies included in the pairs for the LastY-1stY comparison may be different from the number of pairs for the 2ndLastY-LastY or the 1stY-2ndY comparisons. This is so because some companies were suspended or excluded from the Continuous market. For the changes occurred in 2011 and 2018, relevant information from the annual reports of 2009, 2010 and 2019 has been included for the comparisons carried out involving the 2ndLastY and the 2ndY, respectively.

Three aspects related to auditors' characteristics have been analysed. First, the audit fees (AF) of the new incumbent audit firm in comparison to the outgoing audit firm. AF corresponds to fees for the provision of audit services and audit-related, further assurance, services. Second, the non-audit fees (NAF) of the new incumbent audit firm in comparison to the outgoing audit firm. NAF correspond to those related to the provision of non-related audit services, such as tax, consulting or other non-audit services. The figures used in our analyses are those reported in the consolidated financial statements of the Spanish-listed companies and refer to fees paid by the whole group to its main audit firm. Third, we include in our investigation the proportion or ratio between NAF and AF as an indicative proxy for the level of perceived independence of the audit firm.

Our descriptive/comparative analyses are conducted over two four-year periods: the 2011-14 period, that is, before the approval of the 537/2014 EU regulation, and the 2015-18 period, after its approval. This way, we can observe potential 'differences' emanated by this new regulation. As mentioned earlier, in this descriptive analysis of our data, we analyse all listed companies in the Spanish stock exchange, including financial firms, which are usually excluded from the analyses in other studies. The inclusion of financials is particularly important in the Spanish context because banks are among the largest companies in Spain and the ones that pay the highest auditor-related fees.

4.2. Second-step analyses. Panel data, seemingly unrelated regression (SUR), models

The second type of analysis is conducted using panel data for the non-financial firms in our sample. Financial firms are usually excluded from this type of analysis due to their specific characteristics. It is possible that decisions about audit and non-audit fees that auditors make are not independent, but jointly made. To account for the potential dependence of audit and non-audit fee decisions, we carry out panel data analysis using Seemingly Unrelated Regressions (SURs) for AF and NAF as dependent variables. SUR is an approach that considers a joint modelling which takes awareness of correlations between the error terms of the models to yield more efficient estimates (Carmona et al., 2015). For the analysis of the NAF/AF ratio, we carry out panel data analysis after conducting the Hausman test to assess fixed or random effects estimation. Consistent with previous literature, industry and year-fixed effects have been considered in the models. Before these panel data analyses, we conducted correlation analyses, both Pearson's parametric and Spearman's non-parametric, between variables.

The companies selected for our sample are those non-financial entities quoting at the end of two or more complete consecutive years. Our final selection for the 2011-18 period, is made of 119 companies with 779 company/year observations. The number of audit firm switches in this sample is 67, resulting in a proportion of 8.5% of switches. This proportion is higher than the one reported by Cameran et al. (2015) for the Italian mandatory audit firm context. The variables included in our regression modes (see below) capture both, variables related to audit firm rotation and audit firm tenure (independent variables) as well as organisational characteristics that influence audit and non-audit fees (control variables). Analyses have also been carried out for the whole 2011-18 period, as well as for the post-reform period, 2015-18, adapting some of the variables to the new regulatory context. The main differences in the models for the two periods are the variables *Aswitch*, *Amanrot*, *Avolrot* and *EU537*. All audit firm switches were voluntary between 2011-2014 and this, therefore, allows us to differentiate between voluntary and mandatory rotations in the period 2015-2018. The variables that change between the whole period and the post-reform period are highlighted in bold in the models presented below.

MODELS

For the whole 2011-2018 period (Panel A).

$$
\begin{aligned}
\mathrm{AF}_{i,t} = {} & \beta_0 + \beta_1 \mathrm{Atenure}_{i,t} + \beta_2 \mathbf{Aswitch}_{i,t} + \beta_3 APre-switch_{i,t} \\
& + \beta_4 Apost-switch_{i,t} + \beta_5 BIG4_{i,t} + \beta_6 \mathbf{EU537}_{i,t} \\
& + \sum \beta_h \mathrm{CONTROL}_{i,t} + \varepsilon_{i,t}
\end{aligned} \tag{1}
$$

$$
\begin{aligned}
\mathrm{NAF}_{i,t} = {} & \beta_0 + \beta_1 \mathrm{Atenure}_{i,t} + \beta_2 \mathbf{Aswitch}_{i,t} + \beta_3 APre \\
& -switch_{i,t} + \beta_4 Apost-switch_{i,t} + \beta_5 BIG4_{i,t} \\
& + \beta_6 \mathbf{EU537}_{i,t} + \sum \beta_h \mathrm{CONTROL}_{i,t} + \varepsilon_{i,t}
\end{aligned} \tag{2}
$$

$$
\begin{aligned}
NAF/AF_{i,t} = {} & \beta_0 + \beta_1 \mathrm{Atenure}_{i,t} + \beta_2 \mathbf{Aswitch}_{i,t} + \beta_3 APre \\
& -switch_{i,t} + \beta_4 Apost-switch_{i,t} + \beta_5 BIG4_{i,t} \\
& + \beta_6 \mathbf{EU537}_{i,t} + \sum \beta_h \mathrm{CONTROL}_{i,t} + \varepsilon_{i,t}
\end{aligned} \tag{3}
$$

For the 2015-2018 period (Panel B).

$$
\begin{aligned}
\mathrm{AF}_{i,t} = {} & \beta_0 + \beta_1 \mathrm{Atenure}_{i,t} + \beta_2 \mathbf{Amanrot}_{i,t} + \beta_3 \mathbf{Avolrot}_{i,t} \\
& + \beta_4 APre-switch_{i,t} + \beta_5 Apost-switch_{i,t} \\
& + \beta_6 BIG4_{i,t} + \sum \beta_h \mathrm{CONTROL}_{i,t} + \varepsilon_{i,t}
\end{aligned} \tag{4}
$$

$$
\begin{aligned}
\mathrm{NAF}_{i,t} = {} & \beta_0 + \beta_1 \mathrm{Atenure}_{i,t} + \beta_2 \mathbf{Amanrot}_{i,t} + \beta_3 \mathbf{Avolrot}_{i,t} \\
& + \beta_4 APre-switch_{i,t} + \beta_5 Apost-switch_{i,t} \\
& + \beta_6 BIG4_{i,t} + \sum \beta_h \mathrm{CONTROL}_{i,t} + \varepsilon_{i,t}
\end{aligned} \tag{5}
$$

$$
\begin{aligned}
NAF/AF_{i,t} = {} & \beta_0 + \beta_1 \mathrm{Atenure}_{i,t} + \beta_2 \mathbf{Amanrot}_{i,t} + \beta_3 \mathbf{Avolrot}_{i,t} \\
& + \beta_4 APre-switch_{i,t} + \beta_5 Apost-switch_{i,t} \\
& + \beta_6 BIG4_{i,t} + \sum \beta_h \mathrm{CONTROL}_{i,t} + \varepsilon_{i,t}
\end{aligned} \tag{6}
$$

where i=1,…,N; and t=1,…,T. $\varepsilon_{i,t}$ is a composite error term ($\alpha_i + d_t + e_{it}$) that includes: α_i, an firm-specific component of the error term; d_t, a time term; and e_{it}, an idiosyncratic error term. The description of the variables is the following:

VARIABLES

Depend variables

AF: natural log of audit fees in Euros.
NAF: natural log of non-audit fees in Euros.
NAF/AF: non-audit fees divided by audit fees.

Independent variables:

Atenure: Years in which the company has been audited by the same audit firm. It is included in its natural log form (Equations 1-6). The expected sign is positive. The years considered have been those in which the company has been under the monitoring of the CNMV.

Aswitch: dummy variable that takes "1" if the audit firm has changed from the previous year and it is its first year of engagement and "0" otherwise (Equations 1-3). As stated, it is expected to show a significant negative sign based on the initial fee discount for new engagements widely reported in the literature.

Apre-switch: dummy variable equal to "1" if the observation falls in the last year before a firm rotation and "0" otherwise (Equations 1-6). It includes those companies that switched audit firm in 2019. The expected sign is positive.

Apost-switch: dummy variable that takes "1" if the audit firm is in its second or third year of engagement after a switch and "0" otherwise (Equations 1-6). The expected sign is negative.

Amanrot: Dummy variable equal to "1" if there is a *mandatory* firm rotation and "0" otherwise (Equations 4-6). Expected a significant negative sign based on the initial fee discount for new engagements widely reported in the literature.

Avolrot: Dummy variable equal to "1" if there is a *voluntary* firm rotation, "0" otherwise. These companies were not required yet to put their audits to tender but decided to switch following on the new EU audit regulation. This variable is applied only for the 2015-2018 period (Equations 4-6). Expected a significant negative sign based on the initial fee discount for new engagements widely reported in the literature.

BIG4. Dummy variable that takes "1" if the audit firm is a Big-4 firm and "0" otherwise (Equations 1-6). Most academic literature reports a fee premium charged by these firms. It is expected a positive sign.

EU537: Dummy variable that takes "1" if the year is in the 2015-2018 period, years after the approval of the EU537/2014, and "0" otherwise (years 2011-2014). Included for the analyses of the whole 2011-2018 period (Equations 1-3).

Control variables:

In addition to the above-mentioned independent variables, we include several control variables that the academic literature has found determining audit and non-audit fees (e.g. Firth, 2002; Basioudis & Francis, 2007; Asthana & Boone, 2012; Desir et al., 2014; Cameran et al., 2015; Carmona et al., 2015; Corbella et al., 2015; Cho et al., 2021). They capture organisational aspects, such as size, risk, complexity and results of the client companies as well as a measure of the quality of the financial statements.

Size: natural log of total assets in Euros for the current year.
Lever: ratio of total debt to total assets for the current year.
CATA: ratio of current assets to total assets for the current year.
Growth: growth in sales, measured as $(\mathrm{sales}_t - \mathrm{sales}_{t1})/\mathrm{sales}_{t1}$.
ROA: EBITDA divided by total assets.

Loss: Dummy variable that takes "1" if the company has a negative result after taxes and "0" otherwise in the current year.

YQL: Dummy variable that takes "1" if the audit report in the current year is qualified and "0" otherwise.

Industry and year effects are also included in all models. For the industry, we follow the classification of the 7 main industries (sectors) used by BME. The industry excluded from the analyses has been "Financial services", which includes banks, insurance companies, holdings and investment service firms.

5. Analysis of results

Descriptive analyses for the fee-related variables included in our sample of Spanish listed companies are presented in Table 3a, for the total period analysed 2011-18 as well as for the two sub-periods of 2011-14 and 2015-18 (in Table 3b). Information in this descriptive analysis of our sample is provided for the whole sample of financial and non-financial companies. Figures in Table 3a provide information about the audit market context of the Spanish-listed companies. During the whole period, Spanish listed companies paid their main auditors more than € 2.3 billion in fees for their audit and audit-related work and more than € 367 million for non-audit services. Maximum audit fees and non-audit fee values correspond to Spanish banks. Observing the mean values for the two subperiods, audit fees (AF) have, on average, increased from 2011-14 to 2015-18. This is most likely due to the better economic context of Spain as shown by the market value of the listed companies. In contrast, non-audit fees (NAF) have, on average, decreased, which has also resulted in a reduction of the NAF/AF ratio. The mean NAF/AF ratio is significantly lower to the 70% legal cap level included in the reform during the period. Table 3b shows the main descriptives for the variables included in the multivariate analyses. For dummy variables, the number of "1" and the percentage of total observations are presented.

Table 3a. Mean values of the audit variables studied in this paper

		N	Mean	Std. Dev	Min	Max	Total
Audit Fees (AF) (€ 000)	2011-18	909	2,545	8,204	12	96,500	2,313,733
	2011-14	442	2,305	6,759	18	75,300	1,018,711
	2015-18	467	2,773	9,37	12	96,500	1,295,022
Non-audit Fees (NAF) (€ 000)	2011-18	909	404	1,209	0	21,700	367,460
	2011-14	442	453	1,248	0	14,600	200,070
	2015-18	467	358	1,17	0	21,700	167,390
NAF/AF	2011-18	909	0.27	0.43	0	4.41	
	2011-14	442	0.3	0.41	0	4.06	
	2015-18	467	0.25	0.43	0	4.41	
Capitalisation (€ 000)	2011-18	909	4,966,306	12,404,844	6,400	101,073,020	
	2011-14	442	4,528,597	11,747,042	6,400	88,040,560	
	2015-18	467	5,380,582	12,995,825	12,500	101,073,020	

Table 3b. Descriptive figures of the variables included in the panel data analyses

	2011-18					2015-18				
	Dummy =1	Mean	Std. Dev	Min.	Max	Dummy =1	Mean	Std. Dev	Min.	Max
AF (ln)		13.11	1.51	9.39	17.17		13.15	1.51	9.39	17.17
NAF (ln)		9.35	4.84	0.00	15.28		8.94	5.09	0.00	15.28
NAF/AF		0.27	0.44	0.00	4.41		0.26	0.45	0.00	4.41
Size (ln)		20.88	2.04	14.74	25.59		20.90	2.03	14.74	25.54
Lever		0.70	0.88	0.10	21.46		0.63	0.26	0.13	2.11
CATA		0.41	0.21	0.02	1.00		0.40	0.22	0.02	1.00
GROWTH		0.09	0.64	-1.00	7.58		0.16	0.78	-1.00	7.58
ROA		0.08	0.11	-0.61	1.11		0.09	0.12	-0.39	1.07
Loss	210 (27%)					85 (21.1%)				
YQL	24 (3.1%)					8 (2%)				
Atenure (ln)		1.89	0.98	0.00	3.40		1.77	1.02	0.00	3.40
Apre-switch	68 (8.7%)					41 (10.2%)				
Apost-switch	95 (12.2%)					60 (14.9%)				
Aswitch	67 (8.6%)									
Amanrot						12 (3%)				
Avolrot						31 (7.7%)				
BIG4	742 (95%)					387 (96%)				
EU537	402 (52%)									
Obs.*	N=779					N=402				

* Note: Differences with Table 2 figures are due to Table 2 includes both financial and non-financial listed companies.
For dummy variables, the number of 1 and percentage on total observations are presented.
Dependent variables: *AF:* (ln) audit fees. *NAF:* (ln) non-audit fees. *NAF/AF:* non-audit fees divided by audit fees.
Control variables: *Size:* (ln) total assets. *Lever:* total debt on total assets. *CATA:* current assets on total assets. *Growth:* growth in sales. *ROA:* EBITDA divided by total assets. *Loss:* dummy variable that takes 1 if the company has a negative result after taxes and 0 otherwise. *YQL:* dummy variable that takes 1 if the audit report is qualified and 0 otherwise.
Independent variables: *Atenure:* years (ln) in which the company has been audited by the same audit firm. *Apre-switch:* dummy variable equal to 1 if the observation falls in the last year before a firm rotation and 0 otherwise. *Apost-switch:* dummy variable that takes 1 if the audit firm is in its second or third year of engagement after a switch and 0 otherwise. *Aswitch:* dummy variable that takes 1 if the audit firm has changed from the previous year and 0 otherwise. *Amanrot:* dummy variable equal to 1 if there is a mandatory firm rotation and 0 otherwise. *Avolrot:* dummy variable equal to 1 if there is a voluntary firm rotation, 0 otherwise. *BIG4.* Dummy variable that takes 1 if the audit firm is a Big-4 firm and 0 otherwise. *EU537:* dummy variable that takes 1 if the year is in the 2015-2018 period and 0 otherwise.

5.1. Audit firm switches and audit fees

Tables 4a and 4b present the results of our analyses of audit fees related to an audit firm switch during the period analysed. In an attempt to provide an answer to our research statement 1 (*RS1*), Table 4a presents the results of the comparison between the average audit fees of the last year of the outgoing auditor and the average audit fees of the first year of the new incoming auditor, i.e., the LastY-1stY comparison, for the Spanish listed companies that changed their audit firm in the two separate periods of 2011-14 and 2015-18. The results indicate a clear reduction in AF after audit firm switches having taken place in both periods. The difference in the average AF in the two-year comparison is statistically significant in the two periods (*p*=0.016 and *p*=0.003 respectively). We also observe that the overall AF mean values for the 2015-18 period are considerably higher than those of the 2011-14 period. In general, the higher audit fees on aggregate that we document in the later period captures the larger size of the listed companies that switched their auditors in that period as shown in tables A and B in the Annex.

Figures in Table 4a evidence an audit fee discount after an audit switch in Spain in both periods of our sample, that is, before and after the EU reform of 2014. On average, there is an approximately 15-20% overall audit fee discount in the first year of an audit engagement across all companies in the Spanish audit market for listed companies in the period 2011-2018. The evidence in Table 4a also reveals a noticeable reversal in the initial audit fee discount given by the new incoming audit firm. In both periods of our analysis, the new incoming audit firms can considerably increase their audit fees from their first to the second year of engagement. This increase is around 10% for both periods. This result indicates that the new audit firm applies opportunistic behaviour that allows it to 'partially compensate' for the initial discount in the first year of the new audit engagement. It also suggests that the lowballing effect lasts only one year in Spain. On the other hand, the evidence in prior literature indicates that the lowballing effect lasts up to 2-3 years after the initial audit firm switch (Craswell and Francis, 1999; Cameran et al., 2015).

Further, results in Table 4a appear to suggest that the outgoing auditor applies opportunistic behaviour in the last year of the engagement (2ndLastY-LastY comparison). In the last year of engagement, it is shown that the outgoing auditor increases their audit fees charged in both periods of our sample. This average increase is doubled in the post-EU regulation period (6.2% vs 12.3%), but it is very important to note that the difference observed is not statistically significant. However, this analysis has not considered the natural evolution

that the auditee companies have had during the years of the rotation. Thus, our subsequent panel data analyses (Table 4b) control for organisational characteristics that affect audit fees and tests empirically whether there is a lowballing practice as well as whether the observed increase in audit fees during the last year of engagement for the outgoing auditor is positive and significant. Previously to panel data analyses, correlation analyses have been conducted (see tables C and D in the Annex). The results show that the only correlation coefficient higher than 0.6 between independent variables is *Aswitch* and *Avolrot*, for both Pearson and Spearman analyses, but these two independent variables are not included in the same model. *Aswitch* is included in Panel A models, whereas *Avolrot* is included in Panel B models. Thus, no multicollinearity problems have been detected.

Table 4b. Panel data, SUR, results for audit fees determinants in 2011-18 and 2015-18
Dependent variable: Audit fees (lnAF)

	2011-18 Panel A			2015-18 Panel B		
	Coef	Error	P>|z|	Coef	Error	P>|z|
Size	1.149 ***	0.024	0.000	0.667 ***	0.010	0.000
Lever	0.073	0.074	0.325	1.018 ***	0.130	0.000
CATA	3.213 ***	0.344	0.000	0.847 ***	0.125	0.000
Growth	0.042	0.093	0.652	0.002	0.027	0.937
ROA	-0.546	0.614	0.373	1.033 ***	0.243	0.000
Loss	0.417 ***	0.162	0.010	0.257 ***	0.066	0.000
YQL	1.520 ***	0.382	0.000	0.408 **	0.178	0.022
Atenure	0.275 **	0.110	0.013	0.019	0.044	0.665
Apre-switch	-0.029	0.226	0.899	-0.027	0.077	0.729
Apost-switch	0.559 **	0.242	0.021	-0.291 ***	0.083	0.000
Aswitch	-0.729 **	0.324	0.024			
Amanrot				-0.593 ***	0.159	0.000
Avolrot				-0.314 **	0.124	0.011
BIG4	2.325 ***	0.348	0.000	-0.096	0.153	0.531
EU537	0.119	0.189	0.530			
Industry	Yes			Yes		
Time	Yes			Yes		
Nº obs	779			402		

*** Significant at the 0.01 level; ** Significant at the 0.05 level; * Significant at the 0.1 level
In grey, variables that change between periods.
Control variables: *Size:* (ln) total assets. *Lever:* total debt on total assets. *CATA*: current assets on total assets. *Growth:* growth in sales. *ROA:* EBITDA divided by total assets *Loss:* dummy variable that takes 1 if the company has a negative result after taxes and 0 otherwise. *YQL:* dummy variable that takes 1 if the audit report is qualified and 0 otherwise.
Independent variables: *Atenure:* years (ln) in which the company has been audited by the same audit firm. *Apre-switch:* dummy variable equal to 1 if the observation falls in the last year before a firm rotation and 0 otherwise. *Apost-switch:* dummy variable that takes 1 if the audit firm is in its second or third year of engagement after a switch and 0 otherwise. *Aswitch:* dummy variable that takes 1 if the audit firm has changed from the previous year and 0 otherwise. *Amanrot:* dummy variable equal to 1 if there is a mandatory firm rotation and 0 otherwise. *Avolrot*: dummy variable equal to 1 if there is a voluntary firm rotation, and 0 otherwise. *BIG4*. Dummy variable that takes 1 if the audit firm is a Big-4 firm and 0 otherwise. *EU537:* dummy variable that takes 1 if the year is in the 2015-2018 period and 0 otherwise.

Table 4a. Audit fees (AF) descriptives and difference of means results for audit firm changes in 2011-14 and 2015-18

	2011-14				2015-18			
	N	Mean (€ 000)	Std. Dev (€ 000)	Sign.	N	Mean (€ 000)	Std. Dev (€ 000)	Sign.
AF_2ndY	23[1]	1,170	1,579	0.033**	50[3]	4,414	14,394	0.000***
AF_1stY	23	1,056	1,389		50	3,991	12,156	
AF_1stY	**25**	**976**	**1,358**	**0.016****	**51**	**3,922**	**12,044**	**0.003****
AF_LastY	**25**	**1,218**	**1,955**		**51**	**4,599**	**14,691**	
AF_LastY	25	1,218	1,955	0.236	50	4,688	14,825	0.624
AF_2ndLastY	25	1,147	1,747		50[2]	4,175	12,072	

*** Difference of means significant at the 0.01 level, two-tail; ** Difference of means significant at the 0.05 level, two-tail; In bold, the year of change.
AF_2ndLastY: Audit fees the second last year of the outgoing auditor; *AF_LastY*: Audit fees the last year of the outgoing auditor; *AF_1stY*: Audit fees the first year of the incoming auditor; *AF_2ndY*: Audit fees the second year of the incoming auditor.
[1] Two companies, CLEOP and Service Point, were not listed at the end of the 2nd year after the change.
[2] Similarly, one company, Nueva Expresion Textil (Dogi), was delisted at the end of the 2nd last year.
[3] Again, one company, Adveo, was not listed at the end of the 2nd year after the change. Data for Abengoa in 2019 was extracted from the company website, because its financial statements were not available on the CNMV database.

Our SUR panel data analysis goes deeper into the factors determining audit fees and the effect of both the new regulation and audit firm switches on audit fees in the 2011-18 period. Analyses in Table 4b have been conducted for the whole period, 2011-18, Panel A, as well as for the period after the approval of the EU537 legislation, 2015-2018, Panel B.

As for the organisational factors that affect audit fees, as expected the size (*Size*), the current assets/total assets ratio (*CATA*), having a negative result after taxes (*Loss*)and having a qualified audit report (*YQL*) positively affect audit fees in the whole period (Panel A) as well as in the 2015-2018 period (Panel B). As in prior literature, other factors do have an impact on determining audit fees, although their influence on them varies depending on the period analysed. During the 2015-18 period, different organisational features related to the situation of the auditee, have changed their significance. Most interestingly, the *EU537* variable, that captures the period post-reform period is not significant in Panel A. Thus, in the period with the new legislation, there has not been a significant variation of audit fees in comparison to the pre-reform period, although the characteristics of the audited companies affect fees in a different way.

Our variable of interest, *Aswitch*, is significant and negative in the whole period, suggesting that a fee discount is captured in the market when there is an audit firm switch. The *BIG4* variable is only significant for the whole period. The loss of significance of the *BIG4* variable in the post-reform period might be because most audit firm switches are between these firms and, as results show, these switches result in significant discounts. Overall, during the full period, these fee discounts might have reduced the reported fee premium of the Big-4 firms that switched clients.

In addition, consistent with our descriptive and Wilcoxon test analyses discussed earlier, for the full period (2011-2018), audit firms were able to increase their fees throughout the period, both during the second and third year of the audit engagement (*Apost-switch*) and in the subsequent years (*Atenure*). The initial fee discount is also moderated in the following years (*Atenure*). It is evidenced, therefore, if the whole 2011-2018 is considered, that the initial audit fee discount in the first year of the engagement is quickly recovered from the second year onwards in the Spanish audit market. Also, the evidence highlights the existence of the lowballing effect in the Spanish market. Finally, it should be noted that this is consistent with our previous descriptive results in Table 4a. It seems that outgoing auditors do not significantly increase their fees during their last year of engagement as the *Apre-switch* variable is not significant.

Next, we try to tease out the impact of those audit firm switches in the context of mandatory audit rotation (2015-18). We replace *Aswitch* in the model of Panel A by two separate variables that capture the voluntary (*Avolrot*) and mandatory (*Amanrot*) nature of the switches in that period (Panel B). The results indicate that the variable *Avolrot* is negative and significant, revealing a fee discount when there is a voluntary audit firm switch in the post-EU regulation period (i.e., in 2015-2018). Further, the variable *Amanrot* is also significantly negative, suggesting a fee discount granted when companies statutorily switched their external auditors due to the new EU regulation of 2014. The coefficient of *Amanrot* is significantly higher than the *Avolrot*, and this empirical evidence implies that mandatory audit firm switches have resulted in higher discounts than voluntary switches in Spain in the immediate period after the passing of the EU regulation in 2014.

Further, in the analysis of the 2015-18 period, we also document a continuation of the fee discount in the second and third year of the audit engagement (*Apost-switch*). This is opposite to the full period results that we have shown in Panel A of Table 4b. However, such audit fees decrease during the second and third year of engagement is consistent with the results of Cameran et al. (2015) in the Italian mandatory audit firm rotation context. This result is congruent with the idea that audit firms are gaining knowledge about their clients, which leads to lower costs for them and, subsequently, lower fees for their clients. *Atenure* is positive and significant for the whole period, but not for the post-reform period. The lack of significance of the *Apre-switch* variable in this period once again confirms that outgoing auditors do not increase their fees the last year of the engagement. Therefore, our results support a discount effect (RS1) in the Spanish market, and suggest a lowballing effect (P1ii), although not necessarily in the second and third year of the engagement. Our results do not support (P1i), that is, an opportunistic behaviour from the outgoing audit firm in the final year of the audit engagement.

5.2. Audit firm switches and non-audit fees

The provision of non-audit services by the incumbent auditor has created many debates in the society in the previous decades as, it is argued, it may cause impairment of auditor independence. The results in Tables 5a and 5b regarding the evolution of non-audit fees (NAF) in the presence of an audit firm switch show that there are some significant differences depending on the period analysed, as expected. Figures in Table 5a demonstrate a substantial aggregate reduction in NAFs has taken place in the period 2015-18, which is possibly expected, as the new EU regulation has signalled strongly "the inconvenience" of the provision of non-audit services by

Table 5a. Non-audit fees (NAF) descriptives and difference of means results for audit firm changes in 2011-14 and 2015-18

	2011-14				2015-18			
	N	Mean (€ 000)	Std. Dev (€ 000)	Sign.	N	Mean (€ 000)	Std. Dev (€ 000)	Sign.
NAF_2ndY	23[(1)]	250	518	0.074*	50[(3)]	219	702	0.061*
NAF_1stY	23	348	703		50	276	731	
NAF_1stY	**25**	**320**	**680**	**0.455**	**51**	**271**	**725**	**0.006*****
NAF_LastY	**25**	**321**	**618**		**51**	**749**	**3,076**	
NAF_LastY	25	321	618	0.808	50	764	3,105	0.315
NAF_2ndLastY	25	309	689		50[(2)]	609	2,122	

*** Difference of means significant at the 0.01 level, two-tail; ** Difference of means significant at the 0.05 level, two-tail; In bold, the year of change.
AF_2ndLastY: Audit fees the second last year of the outgoing auditor; *AF_LastY*: Audit fees the last year of the outgoing auditor; *AF_1stY*: Audit fees the first year of the incoming auditor; *AF_2ndY*: Audit fees the second year of the incoming auditor.

[(1)] Two companies, CLEOP and Service Point, were not listed at the end of the 2nd year after the change.
[(2)] Similarly, one company, Nueva Expresion Textil (Dogi), was delisted at the end of the 2nd last year.
[(3)] Again, one company, Adveo, was not listed at the end of the 2nd year after the change. Data for Abengoa in 2019 was extracted from the company website, because its financial statements were not available on the online CNMV database.

the external auditor. The total decrease in NAFs is, on average, € 478,000 in 2015-2018 in the Spanish listed market, which is a fall of around 64%, and is statistically significant at 1% level for the year of auditor change (LastY-1stY). As it can be seen in Table 5a, this average reduction in NAF for the companies that switched their auditors has continued from the first to the second year of the audit engagement (1stY-2ndY comparison). In the pre-regulation period, i.e., in 2011-2014, there are fewer audit firm switches and the reduction in NAF, on average, is negligible.

Table 5b presents the results of our multivariate analyses, using a SUR model, and regressing several variables on NAF as the dependent variable. Equations 2 and 5 are used to determine the effect of the new EU legislation on NAF, which confirms the effect of the new EU legislation on NAF, with the variable *EU537* being negative and significant in the whole 2011-18 period.

Table 5b. Panel data, SUR, for non-audit fees determinants in 2011-18 and 2015-18
Dependent variable: Non-audit fees (lnNAF)

	2011-18 Panel A			2015-2018 Panel B		
	Coef	Error	P>|z|	Coef	Error	P>|z|
Size	1.027 ***	0.014	0.000	0.672 ***	0.051	0.000
Lever	0.104 ***	0.021	0.000	0.035	0.659	0.957
CATA	0.831 ***	0.116	0.000	3.592 ***	0.638	0.000
Growth	0.139 ***	0.026	0.000	-0.385 **	0.151	0.011
ROA	0.980 ***	0.176	0.000	-0.417	1.248	0.738
Loss	0.586 ***	0.047	0.000	-0.034	0.356	0.924
YQL	-0.248 **	0.106	0.019	-1.963 **	0.961	0.041
Atenure	0.513 ***	0.031	0.000	-0.106	0.227	0.640
Apre-switch	-1.347 ***	0.062	0.000	-0.679	0.424	0.110
Apost-switch	-0.787 ***	0.067	0.000	-1.934 ***	0.441	0.000
Aswitch	-0.327 ***	0.090	0.000			
Amanrot				-1.213	0.856	0.157
Avolrot				-2.455 ***	0.664	0.000
BIG4	2.910 ***	0.114	0.000	-0.575	0.814	0.480
EU537	-0.968 ***	0.034	0.000			
Industry	Yes			Yes		
Time	Yes			Yes		
Obs	779			402		

*** Significant at the 0.01 level; ** Significant at the 0.05 level; * Significant at the 0.1 level
In grey, variables that change between periods.
Control variables: *Size:* (ln) total assets. *Lever:* total debt on total assets. *CATA:* current assets on total assets. *Growth:* growth in sales. *ROA:* EBITDA divided by total assets *Loss:* dummy variable that takes 1 if the company has a negative result after taxes and 0 otherwise. *YQL:* dummy variable that takes 1 if the audit report is qualified and 0 otherwise.
Independent variables: *Atenure:* years (ln) in which the company has been audited by the same audit firm. *Apre-switch:* dummy variable equal to 1 if the observation falls in the last year before a firm rotation and 0 otherwise. *Apost-switch:* dummy variable that takes 1 if the audit firm is in its second or third year of engagement after a switch and 0 otherwise. *Aswitch:* dummy variable that takes 1 if the audit firm has changed from the previous year and 0 otherwise. *Amanrot:* dummy variable equal to 1 if there is a mandatory firm rotation and 0 otherwise. *Avolrot:* dummy variable equal to 1 if there is a voluntary firm rotation, 0 otherwise. *BIG4.* Dummy variable that takes 1 if the audit firm is a Big-4 firm and 0 otherwise. *EU537:* dummy variable that takes 1 if the year is in the 2015-2018 period and 0 otherwise.

Similarly to the results for audit fees, some organisational characteristics have remained significant for the two periods, 2011-18 (Panel A) and 2015-18 (Panel B). *Size* and *CATA* are positive and significantly affect non-audit fees in both periods. Other control variables are also significant depending on the period. *Growth* is significant in the two periods, but with a different sign, which may be capturing the different economic contexts before and after the reform. Having received a qualified opinion from the external auditor in 2015-2018 suggests that audit firms want to show possibly greater independence from their auditee when issuing concerns about the quality of the financial information. Con-

trary to our earlier results for audit fees in Table 4b, the *EU537* variable is significant and negative in the post-reform period, showing that there is a significant change (reduction) in non-audit fees after the reform. Big-4 firms tend to have higher non-audit fees for the whole period, although not for the 2015-18 period, most likely because many audit firms do not longer provide non-audit services after the reform. The significant coefficient of the *BIG4* in the period 2011-2018 is most probably driven by the significant fee premiums in the pre-regulation period (2011-2014).

As perhaps one would expect, an audit firm switch shouldn't have had an impact on the fees charged for non-audit services. Based on our results, an audit firm switch (*Aswitch*) does not result in a significant variation in non-audit fees for the whole period. However, after the EU reform, an audit firm rotation results in a reduction in non-audit fees, regardless of whether the switch is mandatory (*Amanrot*) or voluntary (*Avolrot*), although significant only for the latter. There is no significant effect on NAF in the initial year of an audit for the whole period, but auditors appear to have a significant NAF reduction in the second and third year of the engagement (*Apost-switch*) in both Panel A and Panel B. This result is consistent with the letter of the new EU law in the period 2015-2018, which imposed a mandatory reduction in the provision of non-audit services by the incumbent external auditor. Thus, new incoming audit firms attempt to portray increased independence after the audit firm switch. Longer audit tenure (*Atenure*) results in higher NAF in 2011-2018, but this has changed after the EU reform because *Atenure* is not significant in the 2015-18 period. Outgoing firms reduce their NAF in the last year of the engagement, as results show a negative sign for the *Apre-switch* variable, although significantly only in the 2011-18 period. Therefore, our research statements related to the provision of non-audit services, RS2, P2i and P2ii, are supported.

5.3. The NAF/AF analysis in the Spanish market

Table 6a provides information on the ratio of NAF/AF. As expected, we notice a higher decrease (in absolute percentage terms) in the ratio in the post-EU regulation period, most likely due to the intention of enhancing the auditor's independence in the EU. The decrease in the ratio happened in the year of auditor change (LastY-1stY) in both subperiods of our investigation, although it is weakly significant only after the reform. Also, it is noticeable that the reduction in the NAF/AF ratio continues into the second year of the audit engagement (the 1stY-2ndY comparison). Despite the higher magnitude of the reduction in the post-reform period, it is not statistically significant. As stated, many companies reported zero NAF, which most likely explains the lack of significance of the Wilcoxon test for the NAF/AF ratio. On the other hand, a small increment in the ratio of NAF/AF for the outgoing firm during the last year (2ndLastY-LastY comparison) is evidenced but, again, it is not statistically significant.

The evolution of the NAF/AF ratio depends on the corresponding evolution of audit and non-audit fees. Table 6b shows the results of the panel data analyses for this ratio. Most of the organizational factors analysed do not significantly affect this ratio. The *EU537* variable (Panel A) is significant and negative, most likely due to the significant reduction of NAF during the post-reform period. The longer the engagement, the higher the ratio when considering the whole period. This has changed after the approval of the new regulation. An audit firm switch does not result in a significant variation of the NAF/AF ratio when the whole period is

Table 6a. Ratio of non-audit to audit fees, descriptives and difference of means results for audit firm changes in 2011-14 and 2015-18

	2011-14				2015-18			
	N	Mean (€ 000)	Std. Dev (€ 000)	Sign.	N	Mean (€ 000)	Std. Dev (€ 000)	Sign.
NAF/AF_2ndY	23[(1)]	0.20	0.24	0.102	50[(3)]	0.12	0.22	0.480
NAF/AF_1stY	23	0.25	0.27		50	0.20	0.47	
NAF/AF_1stY	**25**	**0.23**	**0.27**	**0.357**	**51**	**0.19**	**0.47**	**0.08***
NAF/AF_LastY	**25**	**0.27**	**0.53**		**51**	**0.30**	**0.53**	
NAF/AF_LastY	25	0.27	0.53	0.478	50	0.31	0.53	0.686
NAF/AF_2ndLastY	25	0.24	0.32		50[(2)]	0.30	0.42	

*** Difference of means significant at the 0.01 level, two-tail; ** Difference of means significant at the 0.05 level, two-tail; In bold, the year of change.
AF_2ndLastY: Audit fees the second last year of the outgoing auditor; *AF_LastY*: Audit fees the last year of the outgoing auditor; *AF_1stY*: Audit fees the first year of the incoming auditor; *AF_2ndY*: Audit fees the second year of the incoming auditor.
[(1)] Two companies, CLEOP and Service Point, were not listed at the end of the 2nd year after the change.
[(2)] Similarly, one company, Nueva Expresion Textil (Dogi), was delisted at the end of the 2nd last year.
[(3)] Again, one company, Adveo, was not listed at the end of the 2nd year after the change. Data for Abengoa in 2019 was extracted from the company website, because its financial statements were not available on the online CNMV databas

Table 6b. Panel data results for NAF/AF determinants in 2011-18 and 2015-18
Dependent variable: NAF/AF

	2011-18 Panel A			2015-18 Panel B		
	Coef	Error	P>|t|	Coef	Error	P>|t|
Size	0.009	0.014	0.535	0.023	0.026	0.380
Lever	0.010	0.039	0.802	0.031	0.067	0.645
CATA	-0.100	0.113	0.376	-0.058	0.194	0.766
Growth	0.073 ***	0.023	0.002	0.012	0.028	0.654
ROA	-0.008	0.015	0.579	0.066	0.266	0.806
Loss	-0.006	0.019	0.757	-0.052	0.164	0.752
YQL	0.079	0.102	0.441	0.378 **	0.182	0.038
Atenure	0.046 **	0.020	0.025	-0.022	0.054	0.675
Apre-switch	-0.041	0.053	0.436	-0.034	0.070	0.622
Apost-switch	-0.047	0.065	0.473	-0.224 **	0.089	0.012
Aswitch	0.007	0.090	0.937			
Amanrot				-0.029	0.160	0.858
Avolrot				-0.254 *	0.137	0.064
BIG4	0.126	0.089	0.157	0.002	0.199	0.990
EU537	-0.090 **	0.045	0.046			
Constant	0.093	0.329	0.778	-0.013	0.536	0.098
Industry	Yes			Yes		
Time	Yes			Yes		
Nº obs	779			402		
Hausman test	19.45 (Prob>chi2 =0.135)			10.26 (Prob>chi2 =0.673)		
Wald	31.40 (Prob >chi2 = 0.047)			32.15 (Prob >chi2 = 0.043)		

*** Significant at the 0.01 level; ** Significant at the 0.05 level; * Significant at the 0.1 level
In grey, variables that change between periods.
Control variables: *Size:* (ln) total assets. *Lever:* total debt on total assets. *CATA:* current assets on total assets. *Growth:* growth in sales. *ROA:* EBITDA divided by total assets *Loss:* dummy variable that takes 1 if the company has a negative result after taxes and 0 otherwise. *YQL:* dummy variable that takes 1 if the audit report is qualified and 0 otherwise.
Independent variables: *Atenure:* years (ln) in which the company has been audited by the same audit firm. *Apre-switch:* dummy variable equal to 1 if the observation falls in the last year before a firm rotation and 0 otherwise. *Apost-switch:* dummy variable that takes 1 if the audit firm is in its second or third year of engagement after a switch and 0 otherwise. *Aswitch:* dummy variable that takes 1 if the audit firm has changed from the previous year and 0 otherwise. *Amanrot:* dummy variable equal to 1 if there is a mandatory firm rotation and 0 otherwise. *Avolrot:* dummy variable equal to 1 if there is a voluntary firm rotation, 0 otherwise. *BIG4.* Dummy variable that takes 1 if the audit firm is a Big-4 firm and 0 otherwise. *EU537:* dummy variable that takes 1 if the year is in the 2015-2018 period and 0 otherwise.

considered. However, during the post-reform period (Panel B), both mandatory and voluntary audit firm switches result in a reduction of this ratio, although this reduction is significant only for voluntary switches. In addition, the years following the audit firm switch (*Apost-switch*) result in a reduction of the ratio in both periods, but significant only in the post-reform period, consistent with the negative implications that the provision of non-audit services has on perceived auditor independence. The NAF/AF ratio decreases in the last year

of the engagement of the outgoing audit firm (*Apre-switch*), although this reduction is not statistically significant. Therefore, our research statements related to the provision of non-audit services, *RS2, P2i* and *P2ii*, are, once again, supported.

6. Discussion

The EU has implemented the 537/2014 audit regulation in 2014 to enhance audit quality and audit independence. Probably, the most controversial measure has been the introduction of mandatory audit firm rotation. Despite the academic literature is, to the most, inconclusive about the issue, the promulgation represents a potential revolution of the audit market in the EU. As discussed in the preceding sections of the paper, twenty-five listed companies in Spain changed voluntarily their audit firm during the four years in our sample before the reform. This figure doubled during the 4 years after the approval of the reform, and some of the largest Spanish listed companies were required to change their audit firm. Mandatory rotations started being implemented in 2017 in Spain, as the new EU law that passed in 2014 provided the market with a couple of years of adjustment and correction. Therefore, the audit firm changes after 2015 and before 2017 have, in reality, occurred on a voluntary basis. It is not possible to assert with certainty that all audit changes have been triggered by the EU reform of 2014, but it would be unwise to think that the reform has not influenced the increase of audit firm changes in Spain after the approval of the EU reform.

Our analyses show that an audit firm switch results in a significant audit fee discount by the incoming audit firm. This discount is evident both for the whole period of 2011-2018 (i.e., before and after the reform) and for the period after the reform (i.e., in 2015-2018). The results of our descriptive and Wilcoxon tests show a significant increment of audit fees in the second year of engagement after an audit switch. However, this increment might be due to changes in the organisational features of the auditee, such as their size or income increases, rather than opportunistic behaviour from the auditor. Our multivariate panel data analyses allow us to control for those features. After the reform, the initial discount following a switch continues during the second and third years of engagement. This result is like those of Cameran et al. (2015), who also report a reduction in audit fees during those two years after the initial audit engagement year in Italy. These authors have argued that this discount is a continuation of the lowballing practice, because longer tenure was associated in the past with higher audit fees in the Italian context. However, our results are different when considering the whole period or the post-reform period. The res-

ult of *Apost-switch* for the post-reform period indicates that the discount continues and the potential audit fee reversion might take place later. Moreover, for the post-EU regulation period, *Atenure* is no longer positive and significant, so the continuation of the discount in later years may be the result of the gaining of knowledge about the auditee. However, our study only includes two years of the enforcement of the regulation, so or results should be taken into account with caution. Overall, our results confirm a discount effect after an audit switch but, after the reform and after controlling for auditee characteristics, it is not clear whether this discount is finally reversed and, in that case, when. We also report that outgoing audit firms do not increase its audit fees in their last year of the engagement, i.e. before the switch.

Audit firms may be willing to make favourable offers to attract new clients to capture expected quasi-rents on subsequent audits or as a strategic response to gain market share or establish a "presence" in a specific industry sector (Beatty & Fearnley, 1998). Climent-Serrano et al. (2018) find that the reduction of audit fees has not resulted in a reduction in the quality of the audit service during the financial crisis for Spanish-listed companies. However, users of the financial statements may perceive a worsening of audit quality due to the significant reduction of audit fees in the year of the audit firm change. Regulators should be interested in controlling whether discount practices could damage audit quality, especially during the first year of the audit engagement. The reduction of the audit fees might be the result of devoting lower audit effort and/or fewer audit hours than needed in the first year of engagement or, most probably, be the result of the audit firm's willingness to attract new clients without reducing quality. Under mandatory rotation, the long-term market share of an audit firm will depend more heavily on a firm's ability to attract new clients than it will on its ability to retain existing clients, so audit firms will reallocate resources to attract clients (Comunale & Sexton, 2005). As stated, initial and subsequent fee discounts may be the result of a lowballing practice, but might be also the result of more competition and new procedures that may help firms to reduce audit costs which are then transferred to the new audit clients. Moreover, our results do not seem to support the forecast of Desir et al. (2014) who believed that the "*imposition of mandatory audit firm rotation could curtail the practice of lowballing.*" Another interesting result from our analyses, contrary to those of Cameran et al. (2015), is the evidence that outgoing audit firms in Spain do not charge significantly higher audit fees in the last year of the engagement. In addition, based on our empirical results, outgoing auditors in Spain do not significantly increase their non-audit fees either.

One key aspect of the 537/2014 EU regulation is the ban of the provision of numerous non-audit services as well as a limitation in the proportion of non-audit fees (NAF) received by the statutory auditor. Prior studies find that the provision of these services usually creates spillovers which, it is argued, eventually improves the quality of the statutory audit services. However, the provision of non-audit services has been perceived as a potential harm to auditor independence. Most regulations around the world that have been enacted since the Enron scandal have had the aim of 'ensuring' auditor independence, which resulted in limiting or banning the provision of most non-audit services. One main goal of the new regulation was to ensure audit "independence" by reducing the provision of non-audit services by the incumbent external audit firm. The results of our two types of analyses clearly show that the reform has resulted in a significant reduction of NAF. Our descriptive analysis shows a significant reduction of NAF after the reform, both for the year of change and the following year. Our multivariate analysis confirms that the approval of the new legislation has resulted in a significant reduction of NAF. This effect is evident for both mandatory and voluntary switches, especially for the latter. As stated, a voluntary audit firm change signals concern about the quality of their financial statements from the auditee. In addition, new audit firms also reduce the NAF/AF ratio during the second and third year of engagement. The reduction of NAF reinforces the idea that the change of an audit firm intends to increase the auditor's independence. Therefore, our three related propositions on non-audit fees are confirmed. Our results indicate an apparent loss of the Big-4 audit fee premium in the post-reform period, which may be triggered by the discounts reported after the significant number of audit firm switches in this period, which suggests that competition exists between these firms despite the concentration of the market.

The reduction of non-audit fees has also caused a reduction in the NAF/AF ratio after the approval of the reform. The reduction is more evident for those voluntary audit firm switches after the reform. There seems to be a clear intention from those involved, auditor and auditee, in showing the 'highest' level of independence to preserve the best possible quality of the statutory audit work Our figures have shown an average NAF/AF proportion well below the 70% level imposed by the new EU regulation. Whereas all players in the market are showing enhanced independence by reducing the amount of NAF charged, it is still not clear that this improves audit quality. In a new engagement, the provision of non-audit services would most likely help to gain faster knowledge about the client, which would most likely result in improved audit quality. Moreover, initial audit fee discounts during the first year of engagement, which before the reform could be compensated by the provision of non-audit services, can hardly be compensated after the reform due to the reduction of these services.

To conclude this section, it is worth highlighting one limitation of the study. Our analyses have focused on the effect of the regulatory change on audit and non-audit fees. However, the years in which the reform has been enforced have been relatively short (2 years), because in the Spanish context, the first mandatory audit firm rotations started in 2017. Further research should consider more post-reform years to obtain a better long-term perspective.

7. Conclusions

In 2014, because of the global financial crisis and various financial scandals, the EU approved the 537/2014 regulation aiming at enhancing the audit quality and assurance of financial statements. The reform included some controversial pronouncements such as mandatory audit firm rotation and a severe limitation on the provision of non-audit services. This study has focused on audit firm changes that happened in the period 2011-2018 in Spain to observe their effect on audit and non-audit fees, as well as on the proportion between them. Analyses are conducted in two periods, before and after the enactment of the reform, using two methodological approaches, descriptive and comparative analyses for all listed companies (including the financials) and multivariate, panel data, analyses for non-financial firms to control for organisational characteristics.

An audit fee discount effect is evidenced in the change of audit firms in the Spanish audit market for listed companies before and after the EU537/2014 reform. After the reform, a

significant fee discount is evident for new audit engagements, and audit firms seem to be willing to assume the additional costs of engaging in new contracts. The initial discount is observed for both voluntary and mandatory rotations and there is evidence that it continues into the second and third years of the audit engagement. We also show that audit firms cannot compensate these audit fee discounts with the provision of additional non-audit services, as non-audit fees have also suffered significant reductions due to the new EU legislation. The significant reduction of non-audit fees seems to be a strategy to show enhanced "perceived" independence between auditor and auditee, despite cap levels being far from being reached in Spain. The actual context of stricter regulation, increased litigation and the danger of suffering significant reputational costs in case of audit failures let us presume that audit quality is not harmed in Spain. Contrary to previous research in the Italian context, outgoing audit firms do not show opportunistic behaviour because they do not significantly increase their fees in the last year of the engagement. Our results support the argument that, under a mandatory audit firm rotation legislation, long-term market share seems to depend heavily on an audit firm's ability to attract new clients to compensate for future losses due to the mandatory audit firm switches. The Spanish case provides lessons to other contexts, in particular to those with a similar regulation within the EU, as well as to other developed economies that are discussing the adoption of mandatory rotation for audit firms. Regulators should be aware of this to ensure the quality of auditors, in particular during the first years of new engagement.

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Conflict of interests

The authors declare no conflict of interest.

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ANNEX

Table A. Audit fees for the outgoing and incoming audit firms during the 2011-14 period

YEAR	COMPANY	FORMER AUDITOR	NEW AUDITOR	Audit fees Last Year of Former (€ 000)	Audit fees 1st Year of New (€ 000)	Variation (NEG)	Variation (POS)
2011	Almirall	Deloitte	PwC	696	597	-14.22%	
2011	*Amper*	Deloitte	KPMG	302	556		84.11%
2011	Ence	Deloitte	PwC	256	197	-23.05%	
2011	Endesa	KPMG	EY	7,795	4,259	-45.36%	
2011	Europac	Anefisa	EY	46	279		506.52%
2011	*Gamesa*	Deloitte	PwC	1,451	1,158	-20.19%	
2011	*Prim*	EY	BDO	96	87	-9.38%	
2012	*Abengoa*	PwC	Deloitte	4,331	3,927	-9.33%	
2012	Abertis	PwC	Deloitte	877	2,721		210.26%
2012	*Audax (Fersa)*	PwC	Deloitte	262	207	-20.99%	
2012	*Biosearch*	Deloitte	BDO	46	33	-28.26%	
2012	Cleop	Deloitte	Caruana	82	49	-40.24%	
2012	*Funespaña*	Deloitte	EY	462	259	-43.94%	
2012	Inditex	KPMG	Deloitte	5,204	4,202	-19.25%	
2012	*Solaria*	KPMG	Mazars	304	118	-61.18%	
2012	Tubacex	KPMG	Deloitte	314	383		21.97%
2013	Bankia	Deloitte	EY	3,634	2,025	-44.28%	
2013	Elecnor	Deloitte	KPMG	758	571	-24.67%	
2013	Montebalito	BDO	PKF	72	53	-26.39%	
2013	Red Electrica	PwC	KPMG	219	220		0.46%
2014	*Clinica Baviera*	EY	PwC	71	63	-11.27%	
2014	Ebro Foods	Deloitte	EY	1,520	1,218	-19.87%	
2014	*Gamesa*	PwC	EY	1,417	1,046	-26.18%	
2014	Labor. Reig Jofre	PwC	KPMG	88	99		12.50%
2014	*Service Point*	BDO	EY	138	76	-44.93%	
AVERAGE FEES				**1,218**	**976**		
AVERAGE VARIATION (NEGATIVE/POSITIVE)						**-28.05%**	**139.30%**

In Italics and blue, companies that have changed audit firm twice during the 2011-18 period. Additional to these changes, other listed companies that changed audit firm but were not quoting at the end of the last year of the outgoing audit firm or at the end of the first year of the incoming audit firm were *Pescanova* and *SNIACE*.
Note: The average variation is calculated separately for reductions (-28.05%) and increments (139.30%) of the audit fees the year of change.

Table B. Audit fees for the outgoing and incoming audit firms during the 2015-18 period

YEAR	COMPANY	FORMER AUDITOR	NEW AUDITOR	Audit fees Last Year of Former (€000)	Audit fees 1st Year of New (€000)	Variation (NEG)	Variation (POS)
2015	*Amper*	KPMG	EY	501	430	-14.17%	
2015	Azkoyen	Deloitte	EY	284	265	-6.69%	
2015	Barón de Ley	Deloitte	PwC	46	40	-13.04%	
2015	*Biosearch*	BDO	EY	18	12	-33.33%	
2015	*Funespaña*	EY	KPMG	294	202	-31.29%	
2015	Mapfre	EY	KPMG	8,543	7,200	-15.72%	
2015	*Nueva Expres Textil (Dogi)*	Alfa	PwC	34	120		252.94%
2015	*Prim*	BDO	EY	87	78	-10.80%	
2015	*Solaria*	Mazars	EY	152	110	-27.63%	
2015	Urbas	Deloitte	Baker Tilly	48	76		58.33%
2015	Vocento	Deloitte	PwC	854	538	-37.00%	
2016	Atresmedia	Deloitte	KPMG	249	188	-24.50%	
2016	Banco Santander	Deloitte	PwC	96,500	76,300	-20.93%	
2016	Bankinter	Deloitte	PwC	1,277	916	-28.27%	
2016	Codere	PwC	EY	1,965	1,627	-17.20%	
2016	Duro Felguera	PwC	EY	632	583	-7.75%	
2016	Enagas	Deloitte	EY	1,277	951	-25.53%	
2016	Fluidra	KPMG	EY	984	635	-35.47%	
2016	Indra	KPMG	Deloitte	1,494	1,732		15.93%
2017	Acciona	Deloitte	KPMG	3,665	4,655		27.01%
2017	**Acerinox**	**KPMG**	**PwC**	**809**	**831**		**2.72%**
2017	Adolfo Dominguez	Deloitte	EY	158	133	-15.82%	
2017	Adveo	EY	PwC	430	446		3.72%
2017	AENA	PwC	KPMG	132	291		120.45%
2017	*Audax (Fersa)*	Deloitte	KPMG	189	193		2.12%
2017	BBVA	Deloitte	KPMG	30,100	29,100	-3.32%	
2017	**Bodegas Riojanas**	**PwC**	**EY**	**32**	**28**	**-12.50%**	
2017	**Corp Financ Alba**	**EY**	**KPMG**	**80**	**67**	**-16.25%**	
2017	**Faes Farma**	**KPMG**	**PwC**	**155**	**143**	**-7.74%**	
2017	**Gral Alquiler Maquinaria**	**PwC**	**KPMG**	**271**	**137**	**-49.45%**	
2017	**Iberdrola**	**EY**	**KPMG**	**26,076**	**28,732**		**10.19%**
2017	**Inmob Colonial**	**Deloitte**	**PwC**	**672**	**660**	**-1.79%**	
2017	Lab Farm Rovi	PwC	KPMG	255	180	-29.41%	
2017	**Mediaset**	**EY**	**Deloitte**	**220**	**206**	**-6.36%**	
2017	Realia	Deloitte	EY	168	108	-35.71%	
2017	Renta 4	EY	KPMG	219	206	-5.94%	
2017	Renta Corporacion	PwC	Deloitte	103	78	-24.27%	
2017	**Telefónica**	**EY**	**PwC**	**26,470**	**18,820**	**-28.90%**	
2017	**Vidrala**	**KPMG**	**EY**	**182**	**252**		**38.46%**
2017	**Viscofan**	**EY**	**PwC**	**739**	**569**	**-23.00%**	
2018	*Abengoa*	Deloitte	PwC	2,388	1,625	-31.95%	
2018	Caixabank	Deloitte	PwC	8,816	3,762	-57.33%	
2018	Clinica Baviera	PwC	Mazars	84	68	-19.05%	
2018	Grupo Catalana Occidente	Deloitte	PwC	3,722	3,821		2.66%
2018	**Grupo Ezentis**	**PwC**	**KPMG**	**643**	**510**	**-20.68%**	
2018	Naturgy	PwC	EY	4,757	4,482	-5.78%	
2018	*Nueva Expres Textil (Dogi)*	PwC	KPMG	239	252		5.44%
2018	Oryzon	Grant Thornton	Deloitte	69	55	-20.29%	
2018	**Quabit**	**EY**	**PwC**	**277**	**241**	**-13.00%**	
2018	Repsol	Deloitte	PwC	7,000	7,300		4.29%
2018	*Service Point*	EY	Grant Thornton	90	62	-31.11%	
AVERAGE FEES				**4,599**	**3,922**		
AVERAGE VARIATION (NEGATIVE/POSITIVE)						**-21.28%**	**41.87%**

In Italics and blue, companies that have changed audit firm twice during the 2011-18 period. **In bold,** compulsory changes according to our projections. Additional to these changes, other listed companies that changed audit firm but were not quoting at the end of the last year of the outgoing audit firm or at the end of the first year of the incoming audit firm were *AMREST*, *Pescanova*, *Solarpack* and *Vertice Trescientos Sesenta Grados*.

Note: The average variation is calculated separately for reductions (-21.28%) and increments (41.87%) of the audit fees the year of change.

Table C. Pearsons correlation coefficients and *significance* of the variables included in the panel data analyses (2011-2018)

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1) AF(ln)	Coef. Signif.	1.000																
(2) NAF(ln)	Coef. Signif.	0.490 ** (0.000)	1.000															
(3) NAF/AF	Coef. Signif.	-0.033 (0.360)	0.410 ** (0.000)	1.000														
(4) Atenure(ln)	Coef. Signif.	0.134 ** (0.000)	0.199 ** (0.000)	0.075 * (0.035)	1.000													
(5) Aswitch	Coef. Signif.	-0.077 * (0.031)	-0.121 ** (0.001)	-0.051 (0.153)	-0.585 ** (0.000)	1.000												
(6) Apreswitch	Coef. Signif.	-0.032 (0.368)	-0.084 * (0.019)	-0.015 (0.670)	0.105 ** (0.003)	-0.095 ** (0.008)	1.000											
(7) Apost-switch	Coef. Signif.	-0.066 (0.065)	-0.129 ** (0.000)	-0.069 (0.054)	-0.386 ** (0.000)	-0.114 ** (0.001)	-0.046 (0.202)	1.000										
(8) Amamrot	Coef. Signif.	0.007 (0.836)	-0.048 (0.182)	0.017 (0.629)	-0.239 ** (0.000)	0.408 ** (0.000)	-0.039 (0.281)	-0.046 (0.195)	1.000									
(9) Avolrot	Coef. Signif.	-0.088 * (0.014)	-0.109 ** (0.002)	-0.064 (0.072)	-0.526 ** (0.000)	0.899 ** (0.000)	-0.085 * (0.017)	-0.102 ** (0.004)	-0.034 (0.338)	1.000								
(10) EU537	Coef. Signif.	0.028 (0.429)	-0.087 * (0.015)	-0.042 (0.246)	-0.119 ** (0.001)	0.078 * (0.030)	0.053 (0.140)	0.087 * (0.015)	0.121 ** (0.001)	0.027 (0.452)	1.000							
(11) BIG4	Coef. Signif.	0.294 ** (0.000)	0.336 ** (0.000)	0.099 ** (0.006)	0.186 ** (0.000)	-0.082 * (0.021)	-0.084 * (0.020)	-0.102 ** (0.004)	0.028 (0.438)	-0.104 ** (0.004)	0.049 (0.174)	1.000						
(12) Growth	Coef. Signif.	-0.056 (0.115)	-0.017 (0.627)	-0.031 (0.390)	-0.132 ** (0.000)	0.025 (0.480)	-0.055 (0.127)	0.020 (0.575)	0.122 ** (0.001)	-0.031 (0.390)	0.116 * (0.001)	-0.055 (0.124)	1.000					
(13) YQL	Coef. Signif.	-0.129 ** (0.000)	-0.130 ** (0.000)	-0.004 (0.916)	-0.069 (0.052)	0.078 * (0.029)	0.129 ** (0.000)	0.070 * (0.050)	-0.022 (0.535)	0.096 ** (0.007)	-0.065 (0.071)	-0.240 ** (0.000)	-0.047 (0.188)	1.000				
(14) CATA	Coef. Signif.	0.274 ** (0.000)	-0.137 ** (0.000)	-0.039 (0.277)	0.054 (0.128)	0.008 (0.824)	-0.019 (0.588)	-0.005 (0.896)	-0.002 (0.956)	0.010 (0.787)	-0.011 (0.767)	-0.099 ** (0.006)	0.015 (0.673)	0.037 (0.305)	1.000			
(15) Lever	Coef. Signif.	0.017 (0.637)	-0.018 * (0.611)	-0.031 (0.390)	0.008 (0.828)	0.038 (0.294)	0.101 ** (0.005)	-0.050 (0.162)	-0.019 (0.603)	0.050 (0.162)	-0.078 * (0.028)	-0.119 ** (0.001)	-0.060 (0.093)	0.262 ** (0.000)	0.123 ** (0.001)	1.000		
(16) Loss	Coef. Signif.	-0.157 ** (0.000)	-0.096 ** (0.007)	-0.026 (0.462)	0.069 (0.053)	0.000 (0.993)	0.069 (0.053)	-0.093 ** (0.010)	-0.029 (0.424)	0.014 (0.694)	-0.133 ** (0.000)	-0.164 ** (0.000)	-0.105 ** (0.003)	0.093 ** (0.009)	0.047 (0.185)	0.147 ** (0.000)	1.000	
(17) Size	Coef. Signif.	0.865 ** (0.000)	0.480 ** (0.000)	0.053 (0.140)	0.102 ** (0.004)	-0.063 (0.076)	-0.062 (0.084)	-0.053 (0.137)	0.025 (0.480)	-0.082 * (0.022)	0.014 (0.695)	0.269 ** (0.000)	-0.036 (0.318)	-0.139 ** (0.000)	-0.373 ** (0.000)	-0.096 ** (0.007)	-0.242 ** (0.000)	1.000
(18) ROA	Coef. Signif.	0.117 ** (0.001)	0.082 * (0.022)	-0.061 (0.087)	-0.043 (0.228)	-0.013 (0.720)	0.004 (0.903)	0.040 (0.263)	0.039 (0.271)	-0.033 (0.356)	0.091 ** (0.010)	0.097 ** (0.007)	-0.083 * (0.020)	-0.021 (0.558)	-0.078 * (0.029)	0.162 ** (0.000)	-0.330 ** (0.000)	0.075 * (0.035)

** Significant at the 0.01 level; * Significant at the 0.05 level;

Table D. Spearmans correlation coefficients and significance of the variables included in the panel data analyses (2011-2018)

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1) AF(ln)	Coef.	1.000																
	Signif.																	
(2) NAF(ln)	Coef.	0.663 **	1.000															
	Signif.	(0.000)																
(3) NAF/AF	Coef.	0.178 **	0.788 **	1.000														
	Signif.	(0.000)	(0.000)															
(4) Atenure(ln)	Coef.	0.121 **	0.195 **	0.151 *+	1.000													
	Signif.	(0.001)	(0.000)	(0.000)														
(5) Aswitch	Coef.	-0.086 *	-0.107 **	-0.102 **	-0.485 **	1.000												
	Signif.	(0.017)	(0.003)	(0.000)	(0.000)													
(6) Apreswitch	Coef.	-0.037	-0.058 *	-0.082 *	0.103 **	-0.095 **	1.000											
	Signif.	(0.299)	(0.045)	(0.022)	(0.004)	(0.000)												
(7) Apost-switch	Coef.	-0.063	-0.134 **	-0.090 *	-0.428 **	-0.114 **	-0.046	1.000										
	Signif.	(0.080)	(0.000)	(0.012)	(0.000)	(0.008)	(0.202)											
(8) Amanrot	Coef.	-0.009	-0.048	-0.051	-0.198 **	-0.039	-0.047	-0.035	1.000									
	Signif.	(0.806)	(0.181)	(0.153)	(0.000)	(0.281)	(0.194)	(0.337)										
(9) Avolrot	Coef.	-0.089 *	-0.094 **	-0.088 *	-0.435 **	-0.085 *	-0.103 **	0.028	0.091 *	1.000								
	Signif.	(0.013)	(0.009)	(0.015)	(0.000)	(0.018)	(0.004)	(0.443)	(0.011)									
(10) EUS37	Coef.	0.024	-0.073 *	-0.112 *+	-0.119 **	0.076 *	0.053	0.026	0.011	0.044	1.000							
	Signif.	(0.502)	(0.041)	(0.002)	(0.001)	(0.033)	(0.140)	(0.477)	(0.760)	(0.216)								
(11) BIG4	Coef.	0.296 **	0.264 **	0.235 **	0.194 **	-0.085 *	-0.084 *	0.028	-0.106 **	0.044	0.077 *	1.000						
	Signif.	(0.000)	(0.000)	(0.000)	(0.000)	(0.020)	(0.020)	(0.443)	(0.003)	(0.216)	(0.031)							
(12) Growth	Coef.	0.037	0.004	-0.013	-0.136 **	0.050	-0.046	0.034	0.028	0.011	-0.066	0.077 *	1.000					
	Signif.	(0.304)	(0.910)	(0.718)	(0.000)	(0.164)	(0.202)	(0.345)	(0.443)	(0.701)	(0.067)	(0.031)						
(13) YQL	Coef.	-0.140 **	-0.118 **	-0.070	-0.060	0.078 *	0.129 **	-0.123 **	-0.022	0.096 **	-0.066	-0.244 **	0.077 *	1.000				
	Signif.	(0.000)	(0.001)	(0.051)	(0.097)	(0.030)	(0.000)	(0.001)	(0.534)	(0.007)	(0.067)	(0.000)	(0.031)					
(14) CATA	Coef.	-0.275 **	-0.168 **	-0.066	0.083 *	0.002	-0.020	-0.009	-0.005	0.005	-0.007	-0.078 *	-0.072 *	0.034	1.000			
	Signif.	(0.000)	(0.000)	(0.065)	(0.020)	(0.948)	(0.584)	(0.795)	(0.887)	(0.888)	(0.845)	(0.029)	(0.044)	(0.343)				
(15) Lever	Coef.	0.306 **	0.193 **	0.024	0.093 *	-0.032	0.003	-0.105 **	-0.045	-0.014	-0.111 **	0.063	-0.184 **	0.065	0.056	1.000		
	Signif.	(0.000)	(0.000)	(0.510)	(0.009)	(0.369)	(0.925)	(0.003)	(0.212)	(0.701)	(0.002)	(0.077)	(0.000)	(0.070)	(0.119)			
(16) Loss	Coef.	-0.139 **	-0.107 **	-0.069	0.067	0.000	-0.061	-0.093 **	0.014	-0.029	-0.134 **	-0.157 **	-0.319 **	0.093 *	0.029	0.308 **	1.000	
	Signif.	(0.000)	(0.000)	(0.054)	(0.061)	(0.994)	(0.053)	(0.010)	(0.424)	(0.212)	(0.000)	(0.000)	(0.000)	(0.009)	(0.426)	(0.000)		
(17) Size	Coef.	0.854 **	0.628 **	0.239 **	0.093 *	-0.064	0.069	-0.063	0.014	-0.077 *	0.017	0.270 **	0.064	-0.130 **	-0.379 **	0.241 **	-0.237 **	1.000
	Signif.	(0.000)	(0.000)	(0.000)	(0.009)	(0.076)	(0.091)	(0.077)	(0.688)	(0.033)	(0.638)	(0.000)	(0.074)	(0.000)	(0.000)	(0.000)	(0.000)	
(18) ROA	Coef.	0.178 **	0.120 **	0.078 *	-0.052	0.003	-0.027	0.078 *	0.047	-0.020	0.101 **	0.196 **	0.255 **	-0.118 **	-0.140 **	-0.245 **	-0.512 **	0.161 **
	Signif.	(0.000)	(0.001)	(0.030)	(0.144)	(0.939)	(0.452)	(0.031)	(0.189)	(0.584)	(0.005)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)

** Significant at the 0.01 level; * Significant at the 0.05 level;