An assessment of mandatory audit firm rotation and limitation of non-audit services imposed by the Regulation (EU) No 537/2014: Evidence from Spain

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Abstract:

On May 27, 2014, Regulation (EU) No 537/2014 was published in the Official Journal of the European Union. Aiming to enhance audit quality, the new regulation establishes, among other measures, a maximum tenure of ten years with the audit firm and important limitations to the provision of non-audit services to audit clients by the audit firm. However, it should be noted that the extant research does not unambiguously support that long audit firm tenures or non-audit services impair the quality of audits. This research studies whether these provisions have been empirically associated with reduced audit quality for Spain. Because of its low litigation risk, the potentially negative impact of tenure and non-audit services on audit quality should be clearly observed in the Spanish audit market. Nevertheless, we do not report significantly lower levels of audit quality associated with either long tenures or non-audit services. Our results may have some interesting policy implication as they seem to put into question the necessity of such a regulation for the audit sector.

Key words: audit firm tenure; non-audit fees; audit quality.

1. Introduction

The 2010 Green Paper on Audit Policy by the European Commission (hereafter, "the Green Paper") showed a serious concern about the independence of external auditors and explicitly encouraged further research on the issue. Hence, only four years after the approval of the Directive on Statutory Audit (2006/43/EC) (hereafter "the 2006 EU Directive"), the European Commission openly questioned the sufficiency of the current regulatory framework to adequately guarantee auditor independence. According to the Green Paper, the main threats to the effective independence of external auditors were the provision of NAS by the audit firm to its audit clients[1] and the familiarity between auditors and clients as a result of relatively long audit firm tenures. Regarding the latter issue, the Green Paper explicitly advocated to consider the enforcement of mandatory audit firm rotation.[2]

As a result of this concern, Regulation (EU) No 537/2014 of the European Parliament and of the Council on specific requirements regarding statutory audit of public-interest entities (hereafter "2014 EU Regulation") has established a maximum tenure of ten years with the audit firm as the general rule. Moreover, it has also enforced serious limitations to both the range of NAS to be provided by the audit firm to its audit clients and the total amount of fees to be charged for these services.

However, it should be noted that the concern about the negative effects long audit firm tenures or NAS on audit quality shown by the Green Paper has not been consistently supported by the available evidence (e.g., Johnson et al., 2002 and Myers et al., 2003 for tenure and DeFond et al., 2002 and Callaghan et al., 2009 for NAS). Moreover, in the specific case of tenure, since the available evidence does not generally support that long tenures impair audit quality and given that this evidence was obtained before mandatory partner rotation was established, once partner rotation is already mandatory in the EU, the potentially negative implications of long firm tenures on audit quality should be even less serious.

In this research, we study the impact of both long audit firm tenures and the provision of NAS to audit clients on audit quality. With regard to tenure, since the 2014 EU Regulation establishes a maximum tenure of ten years, we investigate whether there is really a loss of audit quality in audit engagements lasting over ten years. Following this same approach, we also address the impact on audit quality of both the total amount of NAS fees charged by the audit firm to its audit clients and the type of NAS provided to these clients. As the 2014 EU Regulation limits the fees for NAS to 70 percent of audit fees, we investigate whether there is a loss of audit quality when this condition is not met. Next, we classify NAS by nature into three

categories: audit-related services, tax-related services, and other services, and investigate whether the provision of each specific type of NAS is associated with lower audit quality. Following prior research, we use discretionary accruals to measure audit quality (e.g., Myers et al., 2003; Carey and Simnett, 2006). The empirical analysis examines a sample of Spanish public companies for the period between 2005 and 2013.

The motivation for this research lies in the assessment of the most controversial measures included in the 2014 EU Regulation. Both mandatory firm rotation and the severe limitations to the provision of NAS will undoubtedly impact the dynamics of national audit markets in the EU. In countries such as Spain, with a current average audit firm tenure of around ten years, the new regulation will necessarily lead to much shorter audit engagements, thus involving serious implications for audit firms. Additionally, after the enforcement of the new regulation, for some audit firms it might be more rewarding to abandon the auditing of some clients in order to be able to maintain the provision of NAS to them. Therefore, since the 2014 EU Regulation is expected to significantly affect the configuration of the audit sector in the EU, it seems sensible to study whether this regulation is or not justified in terms of enhancing audit quality. Given the importance of litigation risk as a factor of motivation for auditors to achieve high standards of audit quality (e.g., Reynolds and Francis, 2000; Khurana and Raman, 2004; Blay, 2005), the Spanish audit market provides an interesting setting in which to conduct such a study. If long audit tenures and/or NAS constitute serious threats to auditor independence, this situation should be observed more clearly in low litigation risk countries such as Spain, where auditors face weaker incentives to maintain independence.

We extend prior research on the implications of audit firm tenure and NAS on audit quality to the specific provisions established by the 2014 EU Regulation. While the available evidence on these issues provides relevant insights with respect the rationale behind the new regulation, this research aims to contribute to the literature by specifically addressing whether we could expect higher levels of audit quality as a result of the enactment of the most controversial provisions of the regulation.

Our results do not show significantly lower levels of audit quality when audit firm tenure is longer than ten years. The same occurs when fees for NAS charged to audit clients represent more than 70 percent of the audit fees or when the audit firm provides the types of NAS more clearly restricted by the 2014 EU Regulation. These results are robust to various checks. Therefore, the evidence reported here would not support the limitations to the audit activity established by the 2014 EU Regulation and it provides some arguments to the audit profession

who has generally opposed to the new regulation, given the negative impact of these measures on the income statements of audit firms.

The remainder of the article is organized as follows. Section two provides a summary of the international regulation of the auditor-client relationship. Section three reviews the literature on the impact of audit firm tenure and NAS on audit quality and develops the hypotheses to be tested. In section four we define our model and describe the dataset. Results are discussed in section five, while in the last section we draw the conclusions and implications of this research.

2. Regulation of the auditor-client relationship in the EU

As a result of Enron and other financial scandals at the beginning of the century, regulators and policy makers became particularly concerned about the quality of accounting information released by companies. Given the key role played by auditor in guaranteeing the quality of financial statements, the SOX Act required the Government Accounting Office to carry out a study on the potential effects on auditor independence of imposing the mandatory rotation of audit firms (GAO, 2003). The study did not find any negative effects of long tenures on the quality of financial reports and thus it did not recommend mandatory rotation. However, the regulator eventually provided the mandatory rotation, although only of lead audit partners, every five years. Moreover, the SOX Act significantly restricted the types of NAS that audit firms could provide to their audit clients.[3]

With the same aim as the SOX Act in the US, the 2006 EU Directive also enacted the rotation of key audit partners after a maximum of seven years, without imposing the mandatory rotation of audit firms. Moreover, the regulation of NAS provided by audit firms to audit clients was fairly general. Hence, according to Article 22, audit services should not be provided in cases where "an objective, reasonable and informed third party would conclude that the statutory auditor's or audit firm's independence is compromised". According to the Green Paper, Article 22 had been implemented in a very divergent manner across the EU. For example, while in France there was a total ban concerning the provision of NAS to audit clients, as well as strong restrictions on the possibility for the members of the network of the auditor to provide services to the members of the group of the audited entity, in many other member states, rules were much less restrictive.

The Green Paper explicitly put into question the sufficiency of the regulatory framework established by the 2006 EU Directive to adequately guarantee auditor independence. As a result of this concern, the 2014 EU Regulation (Article 17) enacted a maximum tenure of ten years with the audit firm as the general rule.[4] At the expiration of this period, the audit firm cannot re-audit the same client within the following four years. Besides, as in the 2006 Directive, the maximum partner tenure is seven years, and there is a two-year cooling-off period for audit partners before they can re-audit the same client. The new regulation also limits the amount of fees to be charged for NAS to audit clients to 70 percent of the average fees paid to the audit firm for audit services in the last three consecutive years. Moreover, Article 5 also establishes the prohibition for audit firms to provide a wide array of NAS to audit clients, most notably, tax-related services,[5] bookkeeping and preparation of accounting records and financial statements, payroll services, the design and implementation of control and financial information systems and valuation services.[6]

The 2014 EU Regulation had to be applied by member states from 17 June 2016. Once in force, the rotation of the audit firm is mandatory after a maximum of ten years of tenure, the portfolio of NAS to be offered to audit clients has been considerably shortened and the total amount of fees for NAS to be charged to audit clients is limited to 70 percent of audit fees. As a result of these measures the EU has become the economic area with the toughest regulation intended to guarantee auditor independence.

3. Review of the literature and hypotheses development

DeAngelo (1981) defined audit quality as the joint probability that an auditor will both detect (competence) and report (independence) accounting misstatements. The number of years an audit firm has been auditing the same client involves potentially conflicting effects on both dimensions of audit quality. On the one hand, long audit engagements allow a better knowledge of the client, thus enhancing the ability of the auditor to detect accounting misstatements. On the other hand, however, the independence and critical skepticism of the auditor might also be impaired in longer tenures.

Evidence reported by Johnson et al. (2002), Myers et al. (2003), Gul et al. (2007) and (2009) and Lim and Tan (2010) supports the view of a positive relationship between audit firm tenure and audit quality. However, Davis et al. (2009) observed lower audit quality in both the early and the later years of the auditor-client relationship in the pre SOX Act period but not

afterwards. While the aforementioned papers measured audit quality by discretionary accruals, evidence reported with other proxies also tends to support higher audit quality in longer tenures with the audit firm. Hence, long tenures are associated with fewer material misstatements (St. Pierre and Anderson, 1984; Carcello and Nagy, 2004); higher likelihood of going-concern opinions to financially distressed firms (Louwers, 1998; Geiger and Raghunandan, 2002); lower likelihood of earnings restatements (Stanely and DeZoort, 2007); higher levels of accounting conservatism (Jenkins and Velury, 2008) and auditor's response to fraud risk (Cassell et al., 2014).

Similarly, evidence outside the US generally supports a positive (or non-significant) impact of tenure on audit quality. Results from the Taiwanese audit market indicate that discretionary accruals decrease (Chen et al., 2008) or first decrease but later increase (Chi and Huang, 2005) with tenure. Evidence from Australia shows that client managers' accounting discretion increases during the initial years of engagement with the audit firm (Fargher et al., 2008). According with the aim of this research, we are particularly interested in studies conducted within the EU. Neither Vanstraelen (2002) nor Knechel and Vanstraelen (2007) found any significant effects of tenure on the likelihood of going-concern opinions to financially distressed firms in Belgium. On the other hand, results by Piot and Janin (2007) for the French audit market provide some support for an increase of audit quality with tenure. Recent evidence from Italy (Cameran et al., 2016), where the rotation of the audit firm was already mandatory, does not support the view that long tenures impair audit quality, as auditors become in fact more conservative in the last three-year period (the one preceding the mandatory rotation).[7] Finally, prior evidence for Spain is rather mixed. The impact of tenure on audit quality, as measured by discretionary accruals, is either negative (Monterey and Sanchez, 2007), non-monotonic (Jara and Lopez, 2007) or non-significant (Garcia-Blandon and Argiles, 2017). Moreover, Ruiz-Barbadillo et al. (2004) and (2006) do not report significant effects of tenure on audit quality, as measured by the issuance of going-concern opinions to financially distressed firms.

The Spanish audit market, with low litigation risk and long audit firm tenures, provides an interesting setting for the investigation of the impact of tenure on audit quality. Due to the low risk of litigation (Ruiz-Barbadillo et al., 2004), auditors face weaker incentives to maintain independence. Moreover, the generally long audit firm tenures in Spain allow to adequately investigate the implications of the maximum tenure of ten years imposed by the 2014 EU Regulation.[8] The review of the available evidence does not seem to support loss of audit quality in long tenures with the audit firm. However, these studies have not specifically

addressed, as we do, whether audit engagements lasting more than ten years present lower levels of audit quality. Hence, while prior research on the issue aims to answer the general question of how audit firm tenure affects audit quality, we address the much more specific issue of whether tenures longer than ten years are associated with lower audit quality, as the 2014 EU Regulation implicitly assumes. Therefore, unlike prior related studies, this research aims to conduct a direct assessment of the limitation of audit firm tenure to a maximum of ten years established by the new regulation. Although the available evidence does not generally support a negative impact of tenure on audit quality, given the low risk of litigation and relatively long audit firm tenures, Spain would be an ideal candidate in which to observe the negative effects of long tenures on audit quality expected by EU regulators. Therefore, we pose our first hypothesis as follows:

> ***Hypothesis #1:*** Audit quality will be lower for those firms with more than ten years of audit firm tenure.

Similar to what occurs with audit firm tenure, the provision of NAS by the audit firm to audit clients might also impair auditor independence, as it creates stronger bonds (economic bonds, in this case) between auditors and clients. However, it might also provide better and more comprehensive knowledge of the client, and thus it could also improve the competence of the auditor. According to Francis (2006), extant research does not generally support a negative impact of NAS on audit quality. While Frankel et al. (2002) reported a positive relationship between NAS and discretionary accruals, subsequent research (Ashbaugh et al., 2003; Chung and Kallapur, 2003; Kinney, et al., 2004; Antle et al., 2006) has raised serious doubts about this result. However, Larcker and Richardson (2004) also found a positive relationship between the ratio of non-audit fees to total fees and discretionary accruals. Other authors have addressed the effects of NAS on audit quality as measured by the issuance of going-concern opinions to financially distressed firms. Most of these papers do not support a negative effect of NAS on audit quality (DeFond et al., 2002; Geiger and Rama, 2003; Callaghan et al., 2009), some exceptions exist. Blay and Geiger (2013) found that NAS were associated with a lower propensity to issue going-concern opinions in the post-SOX Act era and Gul et al. (2007) concluded that NAS impair audit quality when auditor tenure is short. According to Carcello et al. (2014), the lack of a clear and negative empirical relationship between NAS and audit quality contradicts a related stream of literature which stresses investors' concern about companies purchasing NAS to their audit firms (Krishnan et al., 2005; Higgs and Skantz, 2006; Khurana and Raman, 2006).

While the aforementioned studies were conducted with samples of US companies, non-US evidence is also rather mixed. In the UK, conclusions seem to depend on the proxy used to measure of audit quality. Antle et al. (2006) found that NAS have a statistically significant negative effect on discretionary accruals. However, Firth (2002) and Basioudis et al. (2008) reported a lower likelihood of going-concern opinions to financially distressed firms associated with high NAS, while Lennox (1999) came to the opposite conclusion. Evidence available from Australia has documented either a negative (Wines, 1994; Sharma and Sidhu, 2001) or non-significant (Barkess and Simnett, 1994; Craswell, 1999) relationship between NAS and the likelihood of going-concern opinions. Beyond the Anglo-Saxon context, evidence from the German audit market reported by Ratzinger-Sakel (2013) does not suggest loss of independence associated with high NAS.[9] In the same line, Monterrey and Sanchez (2007) and Carmona and Monparler (2011) failed to report any significant effects of NAS on discretionary accruals in the Spanish audit market. Finally, Habib (2012) provided an interesting review of the literature on the relationship between NAS and audit quality. After performing a meta-analysis based on results across 45 studies, the author concluded that NAS do in fact impair audit quality.

As in the discussion on hypothesis # 1, although evidence reported by previous research is mixed, the low litigation risk Spanish audit market is an ideal candidate in which to observe the negative impact of NAS on audit quality expected by EU regulators. Accordingly, we pose our second hypothesis as follows:

> ***Hypothesis #2:*** Audit quality will be lower for those firms with fees for NAS paid to the audit firm representing more than 70 percent of the audit fees.

Both, regulators and scholars have stressed the importance of taking into account the type of NAS provided by the audit firm to its audit clients, when addressing the NAS-audit quality relationship. Hence, regulators have shown different levels of toughness for different types of NAS. With the aim of improving auditor independence, in 2005 the PCAOB prohibited certain tax consulting services. More recently, the 2014 EU Regulation (Article 5) established the prohibition for the audit firm to provide a wide array of NAS, such as tax-related services, audit-related services (bookkeeping and preparation of accounting records and financial statements) and other services (payroll services, the design and implementation of control and financial information systems and valuation services). In the same line, some empirical studies have taken into account the type of NAS provided by the audit firm (e.g., Kinney et al., 2004;

Joe and Vandervelde, 2007; Paterson and Valencia, 2011). Kinney et al. (2004) found a negative and significant association between audit-related services and unspecified NAS and audit quality, as measured by earnings restatements. However, they also reported a positive and significant association between tax-related services and audit quality. Knechel and Sharma (2012) measured audit quality by audit report lags and found that audit-related NAS were associated with increased audit quality prior to SOX and decreased quality afterwards. Paterson and Valencia (2011) updated the work by Kinney et al. (2004) to the post-SOX era. Similar to them, they found a negative association between both audit-related NAS and other NAS and audit quality, as measured by earnings restatements. For tax-related NAS they reported mixed results.

While the aforementioned papers investigated the US audit market, the results by Svanström (2013) with a sample of Swedish unlisted firms show a positive (negative) relationship between the provision of tax-related services (other services) and audit quality. However, Klumples et al (2016) observed a negative relationship between the provision of tax-related services and auditor independence in the UK.

Similar to these prior studies, we also address the impact of the type of NAS provided by the audit firm to audit clients on audit quality. Hence, we take into account three types of NAS: tax-related NAS, audit-related NAS and other NAS. We expect a negative impact of each type of NAS on audit quality. However, according to prior research this effect should be more clearly observed for audit-related NAS and other NAS than for tax-related NAS. We base this expectation on three main arguments. First, on the available empirical evidence generally showing a negative impact of each type NAS on audit quality; second, on the concern expressed by regulators regarding these specific types of NAS; and third, on the relatively low litigation risk in the Spanish audit market which involve weaker incentives for the auditors to maintain independence. Accordingly, we pose hypotheses H3a, H3b and H3c as follows:

> ***Hypothesis #3a:*** Audit quality will be lower for firms who buy audit-related services to their audit firm.
>
> ***Hypothesis #3b:*** Audit quality will be lower for firms who buy tax-related services to their audit firm.
>
> ***Hypothesis #3c:*** Audit quality will be lower for firms who buy other services to their audit firm.

4. Research design and sample selection

4.1. Research design

As is common in the literature (e.g., Myers et al., 2003; Carey and Simnett, 2006) we assume that high-quality audits should lead to lower levels of discretionary accruals. To estimate discretionary accruals, we use the modified Jones' model given by Equation *(1)* and compute performance-matched discretionary accruals, as suggested by Kothari et al. (2005).

$$TA_t/A_{t-1} = \alpha_1 + \alpha_2(1/A_{t-1}) + \alpha_3((\Delta REV_t - \Delta REC_t)/A_{t-1})) + \alpha_4(PPE_t/A_{t-1}) + \varepsilon_t \quad (1)$$

where:

TA_t is total accruals in year *t*;
ΔREV_t is revenues in year *t* less revenues in year *t-1*;
ΔREC_t is net receivables in year *t* less net receivables in year *t-1;*
PPE_t is gross property plant and equipment at the end of year *t*;
A_{t-1} is total assets at the end of year *t-1*;
α_1, α_2 α_3 and α_4 are the parameters to be estimated; and
ε_t is the error term.

Subsequently, we perform a multivariate analysis with our variables of interest: *LFT10Y, NAS70%, TAXNAS, AUDITNAS* and *OTHERNAS*, and we also include the standard control variables in the discretionary accruals literature (e.g., Myers et al., 2003; Carey and Simnett, 2006). Hence, we propose the model given by Equation *(2).* For the shake of simplicity, firm and year subindexes and industry and year controls are not included.

$$\begin{aligned} ABSDA = {} & \beta_1 + \beta_2 LFT10Y + \beta_3 NAS70\% + \beta_4 AUDITNAS + \beta_5 TAXNAS + \beta_6 OTHERNAS \\ & + \beta_7 PBANK + \beta_8 OPINION + \beta_9 SIZE + \beta_{10} AGE + \beta_{11} LEV + \beta_{12} LLOSS \\ & + \beta_{13} CFFO + \beta_{14} GROWTH + \beta_{15} AUDFIRM + \mu \end{aligned} \quad (2)$$

where:

Dependent variable:

ABSDA: the absolute value of discretionary accruals as computed from Equation *(1)*;

Variables of interest:

LFT10Y: long audit firm tenure, defined as a dichotomous variable which takes the value of 1 when tenure is longer than ten years and 0 otherwise;
NAS70%: NAS representing more than 70 percent of audit fees, defined as a dichotomous variable which takes the value of 1 when fees for NAS paid to the audit firm represent more than 70 percent of the audit fees;
AUDITNAS: audit-related NAS, defined as a dichotomous variable which takes the value of 1 when the audit firm provides audit-related services to the client;
TAXNAS: tax-related NAS, defined as a dichotomous variable which takes the value of 1 when the audit firm provides tax-related services to the client;

OTHERNAS: other NAS, defined as a dichotomous variable which takes the value of 1 when the audit firm provides NAS different than *TAXNAS* or *AUDITNAS* to the client.

Control variables:

PBANK: probability of bankruptcy as measured by adjusted Zmijewski scores with the weights proposed by Carcello et al. (1995);
OPINION: a dichotomous variable which takes the value of 1 if the audit report shows a modified opinion and 0 otherwise;[10]
SIZE: natural logarithm of total assets of the company at financial year-end;
AGE: natural logarithm of the number of years the company has been listed by the supervisor of the Spanish stock market;
LEV: total liabilities divided by total assets at financial year-end;
LLOSS: a dichotomous variable which takes the value of 1 if the client reported a loss for the previous year and 0 otherwise;
CFFO: cash flow from operations over total assets at the end of the fiscal year;
GROWTH: change in assets from prior year;
AUDFIRM: a dichotomous variable which takes the value of 1 if the company is audited by a Big 4 auditor and 0 otherwise.

For industry controls, we follow the industry classification scheme of the Madrid Stock Exchange which comprises six main sectors. Similarly, we include six year dummies.

Next, we discuss control variables in Equation *(2)* in similar terms as in prior research (e.g., Frankel et al., 2002; Johnson et al., 2002; Myers et al., 2003; Carey and Simnett, 2006). *PBANK* measures the probability of bankruptcy based on Zmijewski (1984), with higher values indicating higher probability of bankruptcy and thus, higher levels of discretionary accruals. As in Carey and Simnett (2006), *OPINION* aims to control for higher levels of accruals for those firms with qualified audit reports. *SIZE* is included because large companies are expected to show lower levels of accruals (Watts and Zimmerman, 1986). We include *AGE* because accruals are expected to differ across the firm's life cycle (Anthony and Ramesh, 1992; Healy, 1996; Myers et al., 2003). Following Becker et al. (1998), *LEV* would control for the stronger incentives to manipulate earnings for highly levered firms in order to avoid debt covenant violation. As in Carey and Simnett (2006), with *LLOSS* we aim to control for higher earnings management by companies with losses. Following Myers et al. (2003), *CFFO* is included because firms with higher cash flows from operations are more likely to be better performers (Frankel et al., 2002), and because accruals and cash flows are negatively correlated on average (e.g., Dechow, 1994; Sloan, 1996). We include *GROWTH* because accruals are related to growth opportunities (Johnson et al., 2002). Thus, we expect a positive coefficient on *GROWTH*. The inclusion of *AUDFIRM* is supported by prior studies showing that large audit

firms tend to be more conservative than small firms (e.g., Becker et al., 1998; Francis et al., 1999). Accordingly, we predict a negative sign for the coefficient on *AUDFIRM.*

4.2. Sample and dataset

We conduct the empirical analysis with a sample of non-financial companies listed on the Spanish Stock Exchange (*Sistema de Interconexión Bursátil Español*) during the period between 2005 and 2013. To maintain the comparability of data, the research period starts in 2005, the year in which International Financial Reporting Standards became mandatory for European listed companies (Houqe et al., 2012). Information about audit firm tenure, fees for NAS and the type of NAS provided to audit clients is hand-collected from corporate governance reports. The opinion of the audit report is obtained from the National Securities Market Commission (*Comisión Nacional del Mercado de Valores* - CNMV) website and data for control variables from Thomson Reuters Knowledge. Our final sample consists of 102 firms and 813 firm-year observations.[11]

Insert table 1 around here

Table 1 presents some descriptive statistics on the variables used in this study. Focusing on our variables of interest, almost 50 percent of the observations show audit firm tenures longer than ten years. Thus, the 2014 EU Regulation will involve an important reduction in the length of audit engagements in the Spanish market. On the other hand, the impact of the limitation of fess for NAS should be comparatively weaker, as in only 16 percent of cases, these fees overcome the threshold of 70 percent of audit fees. With regard the type of NAS provided by audit firms to audit clients, 71 percent of clients buy *OTHERNAS*, while the purchase of *AUDITNAS* and, above all, *TAXNAS* is much less usual. As for control variables, 16 percent of the audit reports are qualified and the table also reveals an extreme level of concentration of the Spanish audit market by Big 4 firms, as 91 percent of the audit reports were issued by Big 4 auditors. It should be noted that this market share is extraordinarily high by international standards.[12] Finally, the correlation matrix (not reported) does not suggest multicollinearity problems. Apart from the correlation between *PBANK* and *LEV* (0.67) there are no other correlations greater than +/- 0.40. The analysis of variance inflation supports this view.

5. Results of the empirical analysis

5.1. Main results

We start this section with a preliminary univariate analysis of differences of means and medians of discretionary accruals across groups of firms sorted according to our variables of interest *LFT10Y, NAS70%, TAXNAS, AUDITNAS and OTHERNAS*. Table 2 shows mean and median values of accruals across subsamples of firms, with significance levels. We use the *t-test* to assess the statistical significance of mean accruals and the Mann-Whitney test for median accruals. As shown in the table, firms with tenures longer than ten years present significantly lower mean and median accruals. Conversely, when fees for NAS paid to the audit firm represent more than 70 percent of audit fees, we observe significantly higher levels of accruals. However, while high fees for NAS are associated with lower levels of audit quality, when we focus on the type of NAS we observe that audit related services and other services are associated with significantly lower levels of accruals, while results for tax related services are non-significant. Interestingly, both the *t*-test and the Mann-Whitney test provide very similar results. Therefore, according with the table we should conclude that 1) long audit firm tenures do not seem to impair audit quality, but rather the contrary; 2) high fees of NAS might involve lower audit quality; and 3) none of the three specific types of NAS considered in this research seem to represent any serious threat for audit quality, but rather the contrary.

Insert table 2 around here

However, since the univariate analysis does not control for any of the determinants of discretionary accruals, the reported differences across groups of firms could be explained by some of the omitted variables, in this case having nothing to do with tenure. The multivariate analysis overcomes this limitation. To avoid the negative effects of outliers, estimations are performed with winsorized variables at the top and bottom one percent level. In accordance with the panel structure of the dataset we perform panel data estimations of Equation *(2).* The Hausman test suggests the use of random effects over fixed effects models and the Breusch-Pagan Lagrange multiplier test supports the random effects model over pooled ordinary least square regression. As expected, due to the nature of control variables, the modified Wald test indicates heteroscedasticity in the data. Therefore, we finally perform panel data linear regressions with random effects and robust standard errors.

Insert table 3 around here

Table 3 provides the results of the four estimations of the model given by Equation *(2)*. The estimations differ in the variables of interest included in each case: *LFT10Y* (model 1), *NAS70%* (model 2), *TAXNAS*, *AUDITNAS* and *OTHERNAS* (model 3) and *LFT10Y, TAXNAS, NAS70%,*

AUDITNAS and OTHERNAS (model 4). All four estimations are globally significant at the usual levels (*P-value < 0.00*) with an *R-square* of 36 percent. The main result in table 3 is the lack of significance of the coefficients on our variables of interest in all four estimations. Thus, we do not observe lower audit quality associated with either audit firm tenure longer than ten years, fees for NAS representing more than 70 percent of audit fees or when the audit firm provides tax, audit or other services. The same result holds in all four estimations. Accordingly, hypothesis # 1 stating that audit quality would be lower for firms with tenures longer than ten years would be rejected. We also reject hypothesis # 2 defined as audit quality being lower when fees for NAS represent more than 70 percent of the audit fees and hypotheses # 3a, 3b and 3c, assuming lower audit quality associated with the purchase of certain types of NAS to the audit firm. Therefore, these results indicate that neither long tenures with the audit firm nor NAS seem to represent any serious threat to audit quality.

Since no previous research has addressed the specific issues investigated here, results are not fully comparable with prior studies. However, our findings regarding audit firm tenure support most prior research failing to report a negative effect of tenure on audit quality. As we discussed in the third section of this research, prior evidence on the effects of NAS on audit quality was rather mixed and, in fact, the meta-analysis performed by Habib (2012) led to the conclusion that NAS do compromise audit quality. Nevertheless, our results support prior evidence for the Spanish audit market (Monterrey and Sanchez, 2007 and Carmona and Monparler, 2011) which shows non-significant effects of NAS on discretionary accruals. With regard results for specific types of NAS, prior research has mostly concluded that audit related services and other services would be associated with lower audit quality (e.g., Kinney et al., 2004; Knechel and Sharma, 2009; Paterson and Valencia, 2011), while evidence for tax-related services is rather mixed.

Results for control variables strongly meet our expectations. Hence, we report significant results which are in the predicted direction for *OPINION, SIZE, AGE, LEV, CFFO, GROWTH* and *AUDFIRM*. For *LLOSS*, we find non-significant results while for *PBANK* results are significant but the sign of the effect is contrary to our expectations.

5.2. Additional analyses

Following prior research (e.g., Carey and Simnett, 2006), we check the robustness of the reported results to the method used to compute discretionary accruals. Hence, we perform sequential estimations of Equation *(2)*, with discretionary accruals computed in three different

ways: cross-sectional estimations of the modified-Jones' model at the industry level; industry-panel estimations of the modified-Jones' model with firm specific fixed effects and year specific dummy variables; and abnormal working-capital accruals computed as in Carey and Simnett (2006). In all the estimations performed, we obtain the same result (results not reported): none of the variables of interest shows any significant impact on audit quality. Therefore, we conclude that our main results are robust to how discretionary accruals are computed.

After the estimations of Equation *(2)* using discretionary accruals in absolute values as the proxy of audit quality, following prior research we reestimate the model with raw discretionary accruals (e.g., Carey and Simnett, 2006; Francis and Wang, 2005). This analysis relies on the different practical implications of income-increasing and income-decreasing earnings management. Hence, earnings management through income decreasing discretionary accruals could in fact indicate higher audit quality as it involves stronger accounting conservatism. Table 4 shows the results of the new set of estimations. In general, they are very similar to those in table 3. The main result is the lack of significance of all variables accounting for NAS (*NAS70%, TAXNAS, AUDITNAS* and *OTHERNAS*). However, for *LFT10Y* we report marginally significant results with negative sign (*P-value* < 0.10) in both models # 1 and 4. This suggests higher levels of audit quality when audit firm tenure is longer than ten years. Therefore, the main conclusion from table 3 is reinforced with the results in table 4. Neither long audit firm tenures nor the provision of NAS by the audit firm to its audit clients seem to involve lower levels of audit quality.

Insert table 4 around here

Although the 2014 EU Regulation establishes a maximum tenure of ten years with the audit firm as a general rule, member states might extend this period to 20 or 24 years under certain conditions. There are 97 observations in our sample with audit firm tenures longer than 20 years and six with tenures longer than 24 years. Thus, while we can investigate the potential decline of audit quality after 20 years of tenure, lack of data prevents us from examining audit quality after 24 years of tenure. Accordingly, we reestimate Equation *(2)* after substituting *LFT10Y* by the new variable *LFT20Y* (defined as 1 if audit firm tenure is longer than 20 years and 0 otherwise). Results of the new set of estimations (not reported) do not show significance for the new experimental variable *LFT20Y* in any of the models. Therefore, we do not observe significantly higher or lower levels of discretionary accruals in tenures longer than

20 years. As expected, results for the variables measuring NAS and for control variables are very similar to those in table 3.

6. Concluding remarks

The 2014 EU Regulation will undoubtedly lead to important changes in the audit markets of the EU member states. Both the maximum tenure of ten years with the audit firm as the general rule and the strong limitations to the selling of NAS by the audit firm to its audit clients established by the new regulation have raised a serious concern within the audit profession. The aim of this research is to assess the potential benefits in terms of audit quality associated with the most controversial measures of the new regulation.

Our results do not suggest lower audit quality when audit firm tenure is longer than ten years. Moreover, we report the same results for tenures longer than 20 years, the second threshold considered by the 2014 EU Regulation. Similarly, the provision of NAS to audit clients does not have a significant impact on audit quality. Neither when fees for NAS overcome the limit of 70 percent of audit fees fixed by the regulation nor when the audit firm provides tax-related NAS, audit-related NAS or other NAS to audit clients we are able to observe a lower level of audit quality. These results can be considered as robust as they do not depend on the method used to compute discretionary accruals or whether discretionary accruals are defined in absolute or raw values.

The findings reported here might have some interesting implications for regulators and policy makers. Since we do not observe lower levels of audit quality for firms not meeting the new criteria for audit firm tenure and the provision of NAS established by the 2014 EU Regulation, we should not expect higher levels of audit quality as a result of the application of these criteria. Therefore, the costs of these measures to be assumed by the audit sector and, probably, by the auditors' clients, do not seem to be justified in terms of the achievement of higher levels of audit quality.

This research is subject to at least one limitation which applies to the analysis of the limitation of NAS to 70 percent of audit fees. According to the 2014 EU Regulation, total fees for NAS shall be limited to no more the 70 percent of the average fees paid to the audit firm for audit services in the last three consecutive years. However, the exact assessment of this measure would mean the loss of almost a third of our sample. Therefore, our analysis of NAS accounts for current fees for NAS representing more than 70 percent of current audit fees.

Finally, it should be noted that the reported results refer to the Spanish market, while the 2014 EU Regulation will be applied at the EU level. Because of its low risk of litigation, Spain constitutes an ideal setting for observing the potential benefits of the new regulation in terms of audit quality. Since this is not the case, we would not expect a different result at the whole EU level. However, further research in other EU member states with different levels of litigation risk would undoubtedly contribute to a better assessment of the measures established by the new regulation.

Notes

[1] "Since auditors provide an independent opinion on the financial health of companies, ideally they should not have any business interest in the company being audited." [EC 2010, p. 12].

[2] "Situations where a company has appointed the same audit firm for decades seem incompatible with desirable standards of independence". Even when 'key audit partners' are regularly rotated as currently mandated by the Directive, the threat of familiarity persists. In this context, the mandatory rotation of audit firms –not just of audit partners– should be considered.'' [EC, 2010, p.11].

[3] For example, bookkeeping services or financial information systems design were forbidden.

[4] Nevertheless, member states may provide that the maximum duration may be extended to 20 years if a public tendering process for the statutory audit is conducted and takes effect upon the expiry of the maximum duration period, and to 24 years where, after the expiry of the maximum duration more than one statutory auditor or audit firm is simultaneously engaged.

[5] Among them, the preparation of tax forms and the provision of tax advice.

[6] In addition, member states may prohibit services other than those listed in Article 5 when they consider that those services represent a threat to independence.

[7] Although this result does not seem to support a loss of auditor independence with tenure, the best way to assess the implications of long tenures on audit quality would be in situations in which the rotation of the audit firm is purely voluntarily.

[8] The generally short audit firm tenures of the samples used in most prior studies do not allow adequate assessment of audit quality for tenure lasting over ten years. For example, the average tenure is 4.6 years in Ruiz-Barbadillo et al. (2004); 5.7 years in Chi and Huang (2005); 3.6 years in Knechel and Vanstraelen (2007); and 6.9 years in Chen et al. (2008) and Lim and Tan (2010).

[9] However, there is some evidence that Big 4 audit firms are less likely than their non-Big 4 counterparts to issue a going-concern emphasis-of-matter paragraph for engagements characterized by both relatively high levels of non-audit fees and financial stress.

[10] As Chi and Chin (2011), we consider audit reports with either qualified, unfavorable, disclaimer of opinion, or with explanatory paragraphs expressing doubts about the future of the company, collectively as qualified reports.

[11] Since some firms in the sample entered (left) the Spanish stock market after 2005 (before 2013), the final number of firm-year observations is lower than 918 (102 firms over nine years).

[12] For exemple if compared with the Australian market (64% in Carey and Simnett, 2006) or Taiwan (80% in Chi and Huang, 2005).

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Table 1. Descriptive statistics

VARIABLE	MEAN	MEDIAN	ST. DEV.	MAXIMUM	MINIMUM
LFT10Y	0.49	0.00	0.50	1.00	0.00
NAS70%	0.16	0.00	0.37	1.00	0.00
AUDITNAS	0.09	0.00	0.29	1.00	0.00
TAXNAS	0.19	0.00	0.39	1.00	0.00
OTHERNAS	0.71	1.00	0.45	1.00	0.00
PBANK	-2.07	-1.98	1.60	2.74	-7.21
OPINION	0.16	0.00	0.37	1.00	0.00
SIZE	6.84	6.65	1.77	11.51	3.42
AGE	2.66	2.94	0.59	3.30	0.00
LEV	0.67	0.66	0.28	3.43	0.07
LLOSS	0.21	0.00	0.41	1.00	0.00
CFFO	0.06	0.06	0.10	0.38	-0.29
GROWTH	0.24	0.05	1.77	40.95	-0.65
AUDFIRM	0.91	1.00	0.29	1.00	0.00

LFT10Y: 1 if the tenure with the audit firm is more than ten years and 0 otherwise;
NAS70%: 1 if fees for NAS paid to the audit firm represent more than 70 percent of the audit fees and 0 otherwise;
AUDITNAS: 1 if the audit firm provides audit-related services to the audit client;
TAXNAS: 1 if the audit firm provides tax-related services to the audit client;
OTHERNAS: 1 if the audit firm provides NAS different than TAXNAS or AUDITNAS to the audit client.
PBANK: probability of bankruptcy as measured by adjusted Zmijewski scores, with the weights proposed by Carcello et al. (1995);
OPINION: 1 if the company receives a qualified opinion and 0 otherwise;
SIZE: natural logarithm of total assets of the company at financial year-end;
AGE: natural logarithm of the number of years the company has been listed by the supervisor of the Spanish stock market;
LEV: total liabilities divided by total assets at financial year-end;
LLOSS: 1 if client reported a loss for the previous year and 0 otherwise;
CFFO: cash flow from operations over total assets at the end of the fiscal year;
GROWTH: change in assets from prior year;
AUDFIRM: 1 if the company is audited by a Big 4 audit firm and 0 otherwise;

Table 2. Mean and median discretionary accruals in absolute values by group of *LFT10Y, NAS70%, TAXNAS, AUDITNAS and OTHERNAS*

	ABSDA	
	Mean	**Median**
Total sample	0.064	0.039
***LFT10Y* = 0**	0.073	0.043
***LFT10Y* = 1**	0.052	0.034
Sig. Level	***	***
***NAS70%* = 0**	0.062	0.037
***NAS70%* = 1**	0.076	0.050
Sig. Level	*	**
***AUDITNAS* = 0**	0.064	0.038
***AUDITNAS* = 1**	0.063	0.049
Sig. Level		
***TAXNAS* = 0**	0.069	0.041
***TAXNAS* = 1**	0.046	0.031
Sig. Level	***	***
***OTHERNAS* = 0**	0.080	0.043
***OTHERNAS* = 1**	0.058	0.036
Sig. Level	***	***

*, **, *** Significant at 10 percent, five percent and one percent levels, respectively. The Mann-Whitney test has been used to assess statistical significance of median accruals while the *t*-test has been used for mean accruals.

ABSDA: discretionary accruals in absolute values;
LFT10Y: 1 if the tenure with the audit firm is more than ten years and 0 otherwise;
NAS70%: 1 if fees for NAS paid to the audit firm represent more than 70 percent of the audit fees and 0 otherwise;
AUDITNAS: 1 if the audit firm provides audit-related services to the audit client and 0 otherwise;
TAXNAS: 1 if the audit firm provides tax-related services to the audit client and 0 otherwise;
OTHERNAS: 1 if the audit firm provides NAS different than *TAXNAS* or *AUDITNAS* to the audit client and 0 otherwise.

Table 3. Results of the estimation of Equation *(2)*

Variable	Predicted sign	Model 1	Model 2	Model 3	Model 4
LFT10Y	+ (H1)	-0.003 (-0.61)			-0.003 (-0.60)
NAS70%	+ (H2)		0.005 (0.65)		0.006 (0.73)
AUDITNAS	+(H3a)			-0.003 (-0.36)	-0.004 (-0.45)
TAXNAS	+(H3b)			-0.006 (-1.16)	-0.006 (-1.24)
OTHERNAS	+(H3c)			0.001 (0.12)	-0.000 (-0.02)
PBANK	+	-0.013 (-2.58) ***	-0.013 (-2.53) ***	-0.013 (-2.56) **	-0.013 (-2.54) **
OPINION	+	0.038 (4.04) ***	0.038 (4.06) ***	0.037 (4.07) ***	0.037 (3.96) ***
SIZE	-	-0.005 (-2.53) **	-0.005 (-2.62) ***	-0.005 (-2.55) **	-0.005 (-2.36) **
AGE	-	-0.018 (-2.19) **	-0.018 (-2.19) **	-0.018 (-2.26) **	-0.018 (-2.10) **
LEV	+	0.083 (2.56) **	0.081 (2.49) **	0.082 (2.52) **	0.081 (2.45) **
LLOSS	+	-0.002 (-0.24)	-0.002 (-0.26)	-0.002 (-0.25)	-0.002 (-0.19)
CFFO	-	-0.179 (-3.37) ***	-0.178 (-3.35) ***	-0.183 (-3.39) ***	-0.181 (-3.41) ***
GROWTH	+	0.034 (3.27) ***	0.034 (3.26) ***	0.034 (3.28) ***	0.034 (3.26) ***
AUDFIRM	-	-0.036 (-2.42) **	-0.037 (-2.50) **	-0.036 (-2.41) **	-0.036 (-2.38) **
Industry effects		YES	YES	YES	YES
Year effects		YES	YES	YES	YES
Constant		0.141 (3.36) ***	0.142 (3.43) ***	0.142 (3.37) ***	0.139 (3.24) ***
N **R-sq.** **Wald-Chi sq.**		813 0.36 246.31 ***	813 0.36 285.93 ***	813 0.36 238.18 ***	813 0.36 332.66 ***

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

Equation *(2)*

$$ABSDA = \beta_1 + \beta_2 LFT10Y + \beta_3 NAS70\% + \beta_4 AUDITNAS + \beta_5 TAXNAS + \beta_6 OTHERNAS$$
$$+ \beta_7 PBANK + \beta_8 OPINION + \beta_9 SIZE + \beta_{10} AGE + \beta_{11} LEV + \beta_{12} LLOSS$$
$$+ \beta_{13} CFFO + \beta_{14} GROWTH + \beta_{15} AUDFIRM + \mu$$

LFT10Y: 1 if the tenure with the audit firm is more than ten years and 0 otherwise; *NAS70%*: 1 if fees for NAS paid to the audit firm represent more than 70 percent of the audit fees; *AUDITNAS*: 1 if the audit firm provides audit-related services to the audit client and 0 otherwise; *TAXNAS*: 1 if the audit firm provides tax-related services to the audit client and 0 otherwise; *OTHERNAS*: 1 if the audit firm provides NAS different than TAXNAS or AUDITNAS to the audit client and 0 otherwise; *PBANK*: probability of bankruptcy as measured by adjusted Zmijewski scores; *OPINION*: 1 if the company receives a qualified opinion and 0 otherwise; *SIZE*: natural logarithm of total assets of the company at financial year-end; *AGE*: natural logarithm of the number of years the company has been listed by the supervisor of the Spanish stock market; *LEV*: total liabilities divided by total assets at financial year-end; *LLOSS*: 1 if client reported a loss for the previous year and 0 otherwise; *PERFORM*: earnings before tax over total assets at the end of the fiscal year; *CFFO*: cash flow from operations over total assets at the end of the fiscal year; *GROWTH*: change in assets from prior year; *AUDFIRM*: 1 if the company is audited by a Big 4 audit firm and 0 otherwise.

Table 4. Results of the estimation of Equation *(2)* with raw discretionary accruals instead of absolute discretionary accruals as the dependent variable

Variable	Model 1	Model 2	Model 3	Model 4
LFT10Y	-0.011 (-1.78) *			-0.011 (-1.80) *
NAS70%		0.009 (1.20)		0.011 (1.30)
AUDITNAS			0.007 (0.63)	0.006 (0.53)
TAXNAS			-0.004 (-0.46)	-0.004 (-0.51)
OTHERNAS			-0.002 (-0.32)	-0.004 (-0.57)
PBANK	-0.021 (-4.49) ***	-0.020 (-4.22) ***	-0.020 (-4.14) ***	-0.021 (-4.47) ***
OPINION	-0.027 (-2.03) **	-0.027 (-2.01) **	-0.027 (-2.04) **	-0.028 (-2.12) **
SIZE	0.009 (4.13) ***	0.008 (4.05) ***	0.008 (3.89) ***	0.009 (4.15) ***
AGE	-0.008 (-0.88)	-0.009 (-1.02)	-0.010 (-1.11)	-0.007 (-0.83)
LEV	-0.006 (-0.21)	-0.008 (-0.27)	-0.006 (-0.20)	-0.008 (-0.28)
LLOSS	-0.025 (-2.04) **	-0.026 (-2.10) **	-0.026 (-2.17) **	-0.024 (-2.03) **
CFFO	-0.650 (-13.45) ***	-0.648 (-13.17) ***	-0.649 (-12.80) ***	-0.652 (-13.22) ***
GROWTH	-0.010 (-1.14)	-0.010 (-1.13)	-0.010 (-1.10)	-0.011 (-1.16)
AUDFIRM	0.014 (0.65)	0.011 (0.50)	0.013 (0.62)	0.015 (0.70)
Industry effects	YES	YES	YES	YES
Year effects	YES	YES	YES	YES
Constant	-0.061 (-1.14)	-0.053 (-1.01)	-0.053 (-1.03)	-0.064 (-1.22)
N **R-sq.** **Wald-Chi sq.**	813 0.40 364.58 ***	813 0.40 352.50 ***	813 0.40 369.29 ***	813 0.41 386.49 ***

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

Equation *(2)*

$$ABSDA = \beta_1 + \beta_2\, LFT10Y + \beta_3\, NAS70\% + \beta_4\, AUDITNAS + \beta_5\, TAXNAS + \beta_6\, OTHERNAS$$
$$+ \beta_7\, PBANK + \beta_8\, OPINION + \beta_9\, SIZE + \beta_{10}\, AGE + \beta_{11}\, LEV + \beta_{12}\, LLOSS$$
$$+ \beta_{13}\, CFFO + \beta_{14}\, GROWTH + \beta_{15}\, AUDFIRM + \mu$$

LFT10Y: 1 if the tenure with the audit firm is more than ten years and 0 otherwise; *NAS70%*: 1 if fees for NAS paid to the audit firm represent more than 70 percent of the audit fees; *AUDITNAS*: 1 if the audit firm provides audit-related services to the audit client and 0 otherwise; *TAXNAS*: 1 if the audit firm provides tax-related services to the audit client and 0 otherwise; *OTHERNAS*: 1 if the audit firm provides NAS different than TAXNAS or AUDITNAS to the audit client and 0 otherwise; *PBANK*: probability of bankruptcy as measured by adjusted Zmijewski scores; *OPINION*: 1 if the company receives a qualified opinion and 0 otherwise; *SIZE*: natural logarithm of total assets of the company at financial year-end; *AGE*: natural logarithm of the number of years the company has been listed by the supervisor of the Spanish stock market; *LEV*: total liabilities divided by total assets at financial year-end; *LLOSS*: 1 if client reported a loss for the previous year and 0 otherwise; *PERFORM*: earnings before tax over total assets at the end of the fiscal year; *CFFO*: cash flow from operations over total assets at the end of the fiscal year; *GROWTH*: change in assets from prior year; *AUDFIRM*: 1 if the company is audited by a Big 4 audit firm and 0 otherwise.