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Abstract

We use neo-institutional theory to investigate the effect of disclosed audit sanctions on change in audit firm market share. Using hand-collected data from public oversight board sanctions on audit firms in Italy and Spain, we show that disclosed audit sanctions have a negative effect on audit firm market share change. Moreover, we find that for Big4, severe disclosed audit sanctions have a greater negative effect. We contribute to the literature on public oversight authorities, showing that through disclosing audit sanctions, they help investors to select higher quality auditors, who are able to avoid sanctions and charge a market share premium.

1. Introduction

This study investigates the effects of Disclosed Audit Sanctions (DAS) on Audit Firm Market Share (AFMS) in Spain and Italy. DAS are bad news for auditors because their informational value decreases the reputational value of the auditor brand name, and clients are likely to change auditor. When it loses clients, an audit firm lowers audit fees and loses market share.

This is an important area of research because European Union (EU) countries (Italy and Spain included) introduced changes in audit regulation with the aim of harmonization and improving audit quality. DAS can be used as a variable that directly measures audit quality and the effectiveness of EU audit regulations. The literature investigates audit opinions, audit fees and other significant measures of audit quality extensively, but very few studies exist to date on the effects on AFMS of audit sanctions as a measure of audit failure.

Using the framework of neo-institutional theory, we accept the challenge of conducting "future research toward an examination of which regulatory structure may be most effective in protecting the public interest" (Baker *et al.*, 2014, p. 386), and we find that Spain and Italy are tending to harmonize their audit regulations in a trend towards isomorphism. However, given the mixed findings of prior literature, it is an empirical question whether DAS constitute useful information, which clients use in the selection of audit firms.

On the basis of prior literature on audit inspections and sanctions, we develop hypothesis that aim to improve the strand of research on the link between DAS and change in AFMS. First, we hypothesise that DAS is negatively associated with AFMS change. Sundgren and Svanström (2017) investigate the change in market share after public oversight board sanctions in Sweden for

Big4 audit of private clients. We contribute by studying other European countries (Italy and Spain), other kinds of companies (public interest entities), and other types of audit firm (BigN and non-BigN). Next, we hypothesise that the severity of audit sanction strengthens the change in AFMS, aiming to clarify the role that very serious audit sanctions, longer temporary prohibitions and higher amounts of pecuniary sanctions may have in changing it. Finally, we hypothesise that belonging to Big4 strengthens the negative association of DAS with AFMS.

Hand-collecting data on DAS from Italian and Spanish public oversight boards on auditors and using the data to test models from prior literature, we find that: 1) DAS have a negative effect on the change in AFMS; 2) DAS severity strengthens the effect on AFMS; 3) Big4 DAS has a more negative effect on change in AFMS than non-Big4 DAS.

We contribute to the literature in several ways. Firstly, Italy and Spain are currently adopting EU audit regulations at the start of a harmonization process, which is still ongoing. Changes in audit regulations in these countries are following a process of mimetic isomorphism, and appear to be largely made in response to U.S. audit legislation changes at the beginning of the millennium. Secondly, we show that Public Oversight Boards (POB) through the disclosed audit sanctions can improve audit quality. This means that a POB helps investors to select higher quality auditors, able to avoid sanctions. Low quality auditors can suffer a fee discount and decrease their market share. Thirdly, the study clarifies the interrelation between DAS, audit quality (reputation) and AFMS. While Sundgren and Svanström (2017) investigate private companies in Sweden finding no significant changes in audit market share, we find that audit sanctions negatively affect audit market share in Italy and Spain for Public Interest Entities (PIE). Fourthly, the paper develops investigation of audit sanction severity. Prior literature investigates the severity of audit inspection

results, internal control deficiencies and sanctions on accountants, but no studies exist on audit sanction severity. We show that this variable can be usefully employed for the measurement of audit quality. Juric *et al.* (2018) investigate sanctions on accountants, but here we analyse the severity of audit sanctions, revealing the strong effect of "very serious" and audit sanctions involving higher magnitude. Finally, although Big4 have been studied widely, no study as yet has investigated the reputational effect of DAS. As expected, given that Big4 have much more to lose with a DAS, the negative effect on AFMS is higher for them.

2. Theoretical background and hypothesis

2.1.Audit Sanction Regulations in Spain and Italy

This research analyses DAS imposed by national POB[1] in Italy and Spain. One of the main functions of a POB is the supervision of auditing activities and the exercise of disciplinary power, and imposing sanctions on individual auditors, audit firms or partners. As this study analyses DAS in the period 2010 – 2015, we focus on regulation in force in these years for PIE, given that our sample includes audit sanctions on listed companies.[2]

The European Parliament, (2006) introduced key changes in the public supervision of auditors. Given the lack of harmonization, it required each Member State to have an effective public oversight system of quality assurance on auditing activity and supervision. Italy and Spain both adopted the Directive of European Parliament, (2006) in 2010 (Italian Government, 2010; Spanish Parliament, 2010) (Table 1). In 2014, there was a further change in audit regulation when

[1] In Spain this is the *Instituto de Contabilidad y Auditoría de Cuentas* (ICAC) and in Italy the *Commissione Nazionale per le Società e la Borsa (*CONSOB) for PIE.
[2] Audit sanctions in Italy and Spain are regulated by national legislation, which introduced mandatory audit for specific firms in 1975 and 1988, respectively (President of the Republic, 1975; Spanish Parliament, 1988).

the European Parliament (2014a, b) enacted a Directive and a Regulation, with specific requirements regarding audit of PIE. The purpose was to increase the quality of POB and confer adequate powers on them. Italy and Spain implemented the new Directive in 2016 and 2015, respectively (Spanish Parliament, 2015; Italian Government, 2016). Compared to the 2010 legislation, the new regulations allowed for a wider range of pecuniary sanctions.

In Italy, the POB can impose the following audit sanctions (Italian Government, 2010): 1) pecuniary sanctions on auditors or audit firms from 10000 to 500000 euros; 2) withdrawal of one or more audit engagements; 3) a ban on auditor or audit firms on accepting new audit engagements, for a maximum period of 3 years; 4) temporary prohibition for a maximum of 5 years of the auditor responsible for the audit engagement; 5) removal from the audit firm register of the audit firm or of the auditor responsible for the audit engagement[3]. Where independence is violated, the Italian POB can increase the pecuniary sanction from 100000 to 500000 euros and add an additional audit sanction (2,3,4,5). Finally, auditors involved in violating independence can be sanctioned with temporary prohibition for a maximum of 5 years and struck off the auditors' register.

In Spain, the POB can impose the following sanctions (Spanish Parliament, 2010) for "very serious" audit infractions: 1) Removal from the auditor register; 2) Temporary prohibition, ranging from 2 years and 1 day to 5 years, of the auditor responsible for the engagement; 3) Pecuniary sanctions from 3 to 6 percent of audit fees (at audit firm level) starting from a minimum of 24000 euros, and from 12001 to 24000 euros (at audit partner level). On the other hand, for "serious" audit infractions, the Spanish POB can impose the following sanctions: 1) Temporary prohibition

[3] Audit sanctions 2, 3 and 5 can be considered as audit exclusions: removal from the audit firm register constitutes permanent exclusion. Sanction 3 excludes the audit firm from accepting new audit engagements for a maximum period of 3 years. Sanction 2 excludes the audit firm from ongoing audit engagement if the client is a PIE.

from up to two years of the auditor responsible for the audit engagement; 2) Pecuniary sanctions of 3 percent of audit fees (at audit firm level) starting from a minimum of 12000 euros, and from 3000 to 12000 euros (at audit partner level). The Spanish POB establishes specific factors useful for the distinction between "very severe" and "severe" audit sanctions included the independence principle. In this study we focus on Pecuniary sanctions and Temporary Prohibitions, as they represent types of audit sanctions disclosed in the POB documentations, both in Italy and Spain. They also represent the most common audit sanctions that POB recognize against audit firms, and audit partners, in case of severe violations of auditing standards.

Table 1 provides an overview of audit sanctions in Italian and Spanish regulation for PIE and for types of audit sanctions that we study in this research (Pecuniary sanctions and Temporary prohibitions): a) Spain classifies audit sanctions on the basis of their severity ("very serious", "serious"), but Italy has introduced more severe audit sanctions, when the independence principle is violated; b) Both countries provide for ranges in audit sanctions, which are similar for temporary prohibitions, and very different for pecuniary sanctions. The maximum duration for temporary prohibitions is now harmonized in Italy and Spain at 5 years. Pecuniary sanctions are lower for audit partners and higher for audit firms. Spain defines pecuniary sanctions as a percentage of audit fees, a method that takes into account characteristics of the client, including size, complexity and level of risk. The system in both countries relies fairly heavily on the discretion of the POB in deciding the amount of the sanction; c) Both countries disclose the name of the sanctioned Audit Firm or/and the name of the Audit Partners in the POB documentation[4].

[insert Table 1]

[4] Conversely, in a private warning they are not published.

The appointment of audit firms, both in Italy and Spain, is based on the same European Regulation (European Parliament, 2014b). Shareholders appoint the audit firm in a general meeting, taking account of proposals made by the audit committee. The audit committee makes a recommendation to shareholders for the appointment of statutory auditors or audit firms. This recommendation is justified and contains at least two alternative proposals for the audit engagement, and the audit committee expresses a duly motivated preference for one of them. The audit committee states that its recommendation is free from influence by a third party.

The same Regulation (European Parliament, 2014b) passed the following mandatory audit firm rotation requirement, effective from 2016: "Neither the initial engagement of a particular statutory auditor or audit firm, nor this in combination with any renewed engagements therewith shall exceed a maximum duration of 10 years". Moreover, European Directive (European Parliament, 2006) requires seven-year mandatory audit partner rotation, and both Italy and Spain adopted this requirement in 2010. In our sample period, mandatory audit partner rotation was in force in both countries, and with the same limit (7 years), but mandatory audit firm rotation was in force only in Italy. [5] Italy had a dual mandatory rotation regime, effective at the levels of audit firm and audit partner, while Spain only had the requirement for mandatory audit partner rotation.

The changes in audit regulation made after our sample period and based on European Parliament, (2014a and b) aim to raise levels of audit independence and quality. The adoption in Italy and Spain the Directive and the Regulation improved harmonization and gave greater powers to national POBs, especially as far as PIE are concerned. However, audit sanction regulations were

[5] Italy's mandatory audit firm rotation requirement was established by President of the Republic (1975). It requires a three-year audit firm term that can be reappointed twice to a maximum of nine years.

not significantly modified in the recent changes and the findings of the present research are thus likely to be relevant for the new regulation.

Appendix B shows extracts from Italian and Spanish POB reports. Their reports are very similar, reflecting that they are both based on European regulation. Both reports refer to and explain the infringement of auditing standards. They then show decisions about audit sanctions. The examples include a pecuniary sanction in euros and a temporary prohibition in months.

2.2.Literature review and Hypothesis development

This section is structured as follows. Using neo-institutional theory, we link audit sanction regulation to the isomorphism which prevails between Italy and Spain and which largely explains the process of harmonization of audit regulation between the two countries analysed. Given that audit sanctions affect audit quality and the protection of investors, we next briefly summarise prior literature findings, which are conflicting, on the effects of audit sanction in U.S., Sweden and Spain. Finally, we develop our hypothesis, with the purpose of investigating whether the audit sanctions have informational value which is a credible signal of audit reputational decrease, entailing the loss of audit market share for audit firms sanctioned.

[insert Figure 1 here]

According to neo-institutional theory, organizations will tend to become similar to each other as a result of three influences: coercive, normative, and mimetic isomorphism (Gray *et al.*, 1995, DiMaggio and Powell, 1983). Applying institutional theory, Baker *et al.* (2014) show that the changes in audit regulation in France were consistent with mimetic isomorphism, while changes in Canada were consistent with normative isomorphism (Hay, 2020).

Italy and Spain reacted to financial scandals and the U.S. Sarbanes-Oxley Act (SOX) (30 July 2002) by adopting European Directive (European Parliament, 2006) and national regulations. These new regulations improve quality controls and the related audit sanctions made by national POBs. As EU regulation and national laws were approved largely in response to US legislation, both Italian and Spanish audit regulation changes are consistent with mimetic isomorphism. But although the US model (PCAOB) influences the European model (mimetic isomorphism) and the model in each Member State, including Italy and Spain, the EU has so far failed to fully harmonize auditing regulation fully. Section 2 discusses the differences, which partially persist. The adoption of EU Directives has not eliminated differences in the regulation of statutory auditing in terms of mandatory rotation of audit firm, national POB, and audit sanction ranges for example. However, most EU countries are following a process of mimetic isomorphism, which is improving the level of POB quality control, by way of audit sanctions, among other features.

We choose the neo-institutional theory because Italy and Spain are good examples of EU countries that changed the audit regulations following isomorphism forces. They also harmonize the audit sanction regulation following the same forces and we test the effect of these new harmonized rules on the audit market share changes. We interpret audit sanctions as significant results of the neo-institutional theory and Table 1 clearly shows that changes in audit sanction regulation improve the harmonization in Spain and Italy. Harmonization in not fully achieved, even if it benefits from the mimetic tendencies. The relation between the neo-institutional theory and changes in audit market share is through the audit sanctions. Audit sanctions, that are a result of mimetic isomorphism forces (neo-institutional theory), impact on audit reputation and audit market share.

Audit sanctions are evidence of audit failure, which negatively affect sanctioned auditors, mainly through a decline of auditor's reputation. Khurana and Raman (2004) find that brand name reputation drives the perceived audit quality. Weber *et al.* (2008) study the audit market effect (change in the audit firm) associated with widely publicized accounting scandals involving a Big4: they find an increase in the number of clients moving away from Big4 audit firms in the year of a published scandal, which directly affects audit market share, audit fees, and performance. He *et al.* (2016) analyze whether audit partners suffered damage to their reputations with the demise of Zhongtianqin, the largest audit firm in China, after an audit failure enabled a major client, Yinguangxia, to fraudulently exaggerate its earnings in a high-profile scandal. They find that market shares of these partners fell after the audit firm major client collapse, which supports the interpretation that guiltless partners' reputations were tarnished. They also find that these partners are less likely to be employed by reputable audit firms. The clients of these partners tend to have lower earnings response coefficients, implying that investors downgrade the perceived quality of their audits. Moreover, compared to a matched sample, the former audit firm partners tend to charge lower audit fees after the firm's collapse. They conclude that partners' reputation concerns motivate them to protect audit quality by closely monitoring other partners in the firm.

Among the literature that investigates the effects of POB inspections[6], we analyse Nagy (2014) and Aobdia and Shroff (2017), and our study in fact uses their statistical models. Nagy

[6] Using data from the Netherlands, Van Opijnen, *et al.* (2011) find that companies audited by an audit firm with a positive inspection outcome by the national Netherland public oversight board have lower abnormal accruals than companies audited by an audit firm with a negative inspection outcome. In the US, beyond the specific national public oversight board that inspects auditors, the Security Exchange Commission performs enforcement actions called accounting and auditing enforcement releases (Juric *et al.* 2018, Tran and O'Sullivan, 2018). Several studies analyse determinants of the likelihood of receiving accounting and auditing enforcement releases from the Security and Exchange Commission, such as corporate social responsibility (Tran and O'Sullivan, 2018). With the Sarbanes-Oxley Act, the new oversight board, the Public Company Accounting Oversight Board (PCAOB), has great power and more detailed procedures are laid down for audit inspections. After each inspection, the PCAOB issues an inspection report that includes a public section of identified audit deficiencies (Part I), and a non-public section of identified quality control weaknesses (Part II). Part II of the report only becomes public if the firm fails to satisfactorily remediate the quality control

(2014) examines the change in audit firms' market share following the public disclosure of PCAOB inspection reports, Part II. He finds that audit firms lose a significant amount of market share following the public disclosure of quality control criticisms, suggesting that their informational value is a credible signal of audit failure. The effect on market shares and choice of audit firm by audit clients on the basis of reputation is driven by the failure to satisfactorily remediate the quality control deficiencies by PCAOB.

Similarly, Aobdia and Shroff (2017) analyse the effect of PCAOB inspections on market shares on non-US audit firms that operate in the US, and make a comparison with non-inspected audit firms. They argue that a change in market share is driven by results published in oversight board reports. These reports are signals of the value of the POB activity, in terms of increasing audit quality. Specifically, they find that clean inspection report can increase an auditor's market share, presumably because it lowers concerns about auditor independence and competence. This is coherent with our expectation that audit sanctions (that follow a not clean inspection) can decrease an auditor's market share.

Prior literature also analyses the effects of audit sanctions in several countries. For example, Sundgren and Svanström (2017) find that auditors do not become more conservative in their reporting and do not lose market share. They conclude that POB sanctions have relatively limited consequences for auditors in Sweden[7]. Moreover, Spanish studies investigate

deficiencies in a 12-month period. Several studies investigate Part I of PCAOB inspection reports (Lennox and Pittman, 2010; Daugherty, Dickins and Tervo, 2011; Gramling, Krishnan and Zhang, 2011; Abbott, Gunny and Zhang, 2013; Gunny and Zhang, 2013; Abbott *et al.*, 2018; Kang *et al.* 2014), while fewer studies investigate Part II (Ragothaman, 2012; Nagy, 2014; Van Linden and Mazza, 2018). Lennox and Pittman (2010) find that audit clients do not perceive the PCAOB inspection reports as informative and suggest that the reason may be due to PCAOB failure to disclose quality control information in the reports. Part II can thus influence audit firm market share only when it becomes public (Nagy, 2014).

[7] Hottegindre and Lesage (2009) analyze the infringements that cause disciplinary actions in France. They find that incompetence is less frequent than non-independence, but the frequency ratio is only 1 to 2, which implies that independence should not be the only aim of regulation. The Spanish literature on audit sanctions notes that there is an increase in the number of audit sanctions in the period 1990-2013, and that among the very serious sanctions, the main infringement committed is related to independence,

consequences and determinants of audit sanctions. De Fuentes *et al.* (2015) investigate the effects of audit sanctions in Spain on earnings quality. Analyzing financial statements in the period 1995–2007, they find that companies audited by non-Big4 sanctioned auditors in the pre-inspection period are less likely to avoid bottom-line losses than clients of non-sanctioned

While most of prior literature investigates the association between the disclosure of inspection reports and audit quality, very few studies exist on the relation between DAS and AFMS change. Sundgren and Svanström (2017) find that Big4 auditors of private companies do not lose market share after receiving a sanction from the Swedish public oversight board, while prior US literature finds a significant negative audit market share change. Given the conflicting results of prior literature, it is an empirical question whether the informational value of an audit sanction is a credible signal of audit failure that can have negative consequences on audit market share. We contribute to the literature by investigating both Big4 and non-Big4 audit firms in Italian and Spanish PIE, and by clarifying the effects of audit sanctions on AFMS change.[8] Given the reputational risks associated with audit sanctions, we expect that:

H1: Disclosed Audit sanctions are negatively associated with change of audit firm market share

There is little existing research on audit sanction severity. Some research has analysed severity in terms of audit standards or principles violated. Nagy, (2014) analyses the severity as an additional analysis. He classifies criticisms into three main categories: audit performance,

followed by the transmission of information to the oversight boards (Amesti, 1996; Moya, 1996; Navarro and Bernad, 2004; Fau, 2014). Other research investigates Germany and the Netherlands (Blij *et al.*, 1998; Quick and Warming-Rasmussen, 2006).

[8] In terms of a change analysis, we mean a higher decrease of a lower increase of market share from one year to the following year. This analysis is based on prior research which provides evidence of audit firms losing market share after their reputations have been damaged (Firth, 1990; Barton, 2005; Hilary and Lennox, 2005; Weber, Willenborg and Zhang, 2008; Lennox and Pittman, 2010).

independence and monitoring, and audit identification of weaknesses; arguing that each category has a different level of severity. He finds that clients consider the severity of the inspection reports in terms of number of criticisms listed when assessing auditor quality.

Other research has analysed severity based on the quantitative magnitude of the materiality level. Bedard and Graham (2011) analyse the severity of internal control deficiencies. They define severity by dividing deficiencies into material weaknesses, significant deficiencies and control deficiencies on the basis of the magnitude of the materiality threshold.

Prior studies on sanction severity analyse determinants of severity. Juric *et al.* (2018), investigating sanctions imposed on accountants, find that the primary factors relating to the severity of actions by the Security Exchange Commission are as follows: whether the certified public accountants intentionally breached the professional code of conduct, their age, their membership of the American Institute of Certified Public Accountants and whether they were operating as an external auditor or in a corporate accounting role.

Previous literature investigates the severity of inspections, internal control deficiencies and sanctions imposed on accountants, but there are no existing studies which analyse the effect of the severity of audit sanction on audit market share. Given the negative consequences of severe internal control deficiencies and inspections by POB, we expect that the:

H2: Severity of audit sanctions strengthens the negative association with audit firm market share.

The use of Big4 vs non-Big4 audit firms is widely employed as measure of audit quality. DeAngelo (1981); Francis and Wilson (1988); Simunic and Stein (1987) develop the theoretical

relationship between audit quality and Big4 and find that Big4 is a proxy for brand name reputation. Big4 is linked to higher reputation, more resources, high potentials performances, and to higher audit quality: audit sanctions are big threats for Big 4 reputation. For public firms (our sample), prior empirical studies have found that Big4 are related to higher earnings and audit quality because they are associated with: fewer type I and II errors based on going concern opinion (Francis and Krishan, 1999); higher audit fees (for instance Palmrose, 1986); lower cost of equity capital (Khurana and Raman, 2004); higher market reaction (Balsam *et al.*, 2003;); lower discretionary accruals (Becker *et al.*, 1998), lower CoD (Blackwell *et al.*, 1998).

Few researchers about the effects of audit sanctions consider the audit size effect: Sundgren and Svanström (2017) find that Big4 auditors of private companies are paid a lower salary after when the company is sanctioned the Swedish public oversight board than before. Prior literature analyzes private companies, but it is an empirical question whether the audit firm size affects the listed audit market share, after an audit sanction, or compared with non-sanctioned auditors. As Big4 have a higher reputational risk and more to lose than non-Big4, we expect that:

H3: Big4 audit sanctions strengthens the negative association with audit firm market share.

3. Empirical tests

3.1. Sample selection

We downloaded Italian and Spanish public documents on audit sanctions from internet for the period 2010-2015, as we aim to study a period with similar audit regulations in Italy and Spain: from 2010 is effective in these countries the Directive 2006/43/EC. We then hand-collected data

on names of audit firms, financial statements audited related to the sanction, the year of the sanction and of the financial statement, the amount or period of the sanction. Table 2 reports the year distribution of the audit sanctions. We hand collect temporary prohibitions at partner level, given the non-existence of temporary prohibition at firm level. We select pecuniary sanctions at firm level, to ensure homogeneity with our dependent variable (audit firm market share), and because of the higher amount and importance of pecuniary sanctions at firm level.

[insert Table 2 here]

3.2.Models and measurement of variables

We employ two methodologies.

First, following Nagy (2014), the sample includes the treated firms (audit firms sanctioned) and the control firms (audit firms not sanctioned). We compare the change in market share one year after the publication of the sanction for the sanctioned audit firms with the change in market share for the non- sanctioned audit firms measured for the same calendar years of the sample period. We use for Spain 11 firm-year observations for 10 treated firms and 11 firm-year observations for 10 control firms; for Italy 15 firm-year observations for 9 treated firms and 15 firm-year observations for 9 control firms. This yields a total of 11+11+15+15= 52 observations. The selection procedure of the control sample requires the download of financial statements from company websites of listed firms in the same industry as the treated firms. Next we hand collected total assets and compared the size of the companies in order to select control firms of similar size. We test Hypothesis 1 with Equation (1a), adapting Nagy's model (2014) as follows:

$\Delta Market\ Share =$	$\beta_0 + \beta 1\ Sanctioned\ treated\ firm + \beta 2\ \Delta PYMarket\ share + \beta 3\ Market\ share\ level + \beta_5\ Country\ level\ variable + e$	*Equation (1a)*	*H1*

Secondly, following Aobdia and Shroff (2017), we test whether the change in auditor market share in the year after the sanction year is different from the change in market share in other years for the audit firms sanctioned. For this method, we use for Spain 11 firm-year observations in the year after the sanction and 54 observations in other years, and for Italy 15 treated firm-year observations in the year after the sanction and 48 observations in other years. This yields a total of 11+15+48+54= 128 observations in the regression. We test Hypothesis 1 with Equation (1b), adapting the model of Aobdia and Shroff (2017) as follows:

$\Delta Market\ Share_t =$	$\beta_0 + \beta_1\ Sanction\ year_{t+1} + \beta_2\ \Delta PYMarket\ share + \beta_3\ Market\ share\ level + \beta_4\ Big4 + \beta_5 Client\ firm\ size + \beta_6\ \%Client\ loss + \beta_7\ Country\ level\ variable + e$	*Equation (1b)*	*H1*

We test our hypothesis analysing the stronger effects of H2 with Equation (2), and the effects of H3 with Equation (3):

$\Delta Market\ Share_t =$	*Basic model* + β *Severity*Sanctioned treated firm (Sanction year t+1)* *Severity* can be severity by infringement (Equation 2a) or severity by magnitude (Equation 2b)	*Equation (2)*	*H2*
$\Delta Market\ Share_t =$	*Basic model* +β *Big4*Sanctioned treated firm (Sanction year t+1)*	*Equation (3)*	*H3*

The dependent variable *ΔMarket Share* is the change in the market share of the audit firm from year t to year t-1. An auditor's market share equals the total revenues of an audit firm divided by the sum of the revenues of all audit firms in the country-year.

To test H1, we adapt from the model of Aobdia and Shroff (2017) the variable "*Sanction year t+1"* which measures the effect of the audit sanction in the year t+1 following the year t in which a CONSOB or ICAC inspection report becomes publicly available. From the model of Nagy (2014) we adapt the variable "*Sanctioned treated firm"* which measures the effect on audit

market share of sanctioned audit firm compared with non-sanctioned audit firm, consequent to public disclosure of audit sanctions. Our main aim is to test whether these variables, which have implications for audit quality, are associated with the change in audit firm market share.

Sanction year t+1 and *Sanctioned treated firm* are interacted with audit sanction *Severity* to test H2. Audit sanction severity is measured using two variables:

a. Severity of infringement (Equation 2a) as classified by the Spanish authority, which separates "very serious" from other audit sanctions according to which audit standard or principle has been violated. We replicate the classification used in Spain for Italian audit sanctions. This variable comes from the literature discussing infringements (Nagy, 2014).
b. Severity by magnitude (Equation 2b) based on the monetary value and the number of months of prohibition. Because there are differences between Spain and Italy, we use a variable based on a quartile of the distance from the maximum sanction. This variable comes from the literature, which uses quantitative materiality thresholds (Bedard and Graham, 2011).

Finally, *Sanction year t+1* is interacted with *Big4* to test H3 with a dummy variable which distinguishes the effect of audit sanctions between Big4 and non-Big4.

Control variables are at audit firm level (Nagy, 2014), client level (Aobdia and Shroff, 2017), and country level (country fixed effect). At audit firm level, following Nagy (2014), the unit of measure is the audit firm, and the control variables attempt to capture any audit firm confounding effects on the change of auditor market share. The lag variable *ΔPYMarket share* controls for market share changes in the year prior to the report disclosure because this study attempts to capture market share change rates of audit firms which are abnormal (Nagy, 2014). A positive coefficient of the *ΔPYMarket share* variable would suggest that audit firm market share

change rates are persistent. We also control for *Market share level* because checking the level is also important in measuring change. The variable *BIG4* controls for any audit firm size and competition effects (Lennox and Pittman, 2010). There is no predicted coefficient direction for the audit firm size control variables. A positive coefficient direction for the audit firm size control variable can be found because Big4 audit firms have a higher reputational risk and more to lose than non-Big4, that brings to larger market share change year-by-year. On the other hand, a negative coefficient direction can be found because Big4 audit firms have higher audit quality and clients do not change auditor year-by-year frequently. At client level, based on prior research (Chow and Rice, 1982; Krishnan and Review, 1994; Landsman, Nelson and Rountree, 2009; Swanquist and Whited, 2015), we control for the following variables in our regressions that control the audit firm's clients effects (Aobdia and Shroff, 2017): the size of all clients, measured as the log of assets (*Client firm size*); a dummy variable capturing the clients' net income of the year of the financial statement that received the sanction is negative *(%Client loss*). We expect that if the client sanctioned is big or making losses, there is a higher probability of a fall in market share after the sanction. Finally, at country level we include the variable "country fixed effect", aiming to verify the significant effect of audit sanctions independently from the country (Italy or Spain).

4. Results

4.1.Univariate tests

Table 3 shows the descriptive statistics. Table 3 – Panel A reports descriptive statistics for variables related to Italy and Table 3 – Panel B includes the descriptive statistics for variables related to Spain.

In Italy, the mean of audit firm market share change is negative (-0.002) for sanctioned auditors and positive (0.002) for non-sanctioned auditors and null (0.000) for non-sanctioned years. In other words, the sanctioned audit firm loses market share, while the non-sanctioned audit firm gains market share (Nagy, 2014 model). Finally, sanctioned audit firms lose market share in the year after the disclosure of audit sanction, and they do not lose market share in the other years before and after the disclosure of the audit sanction (Aobdia and Shroff, 2017 model).

In Spain the picture is similar: the mean of audit market share change is negative for sanctioned auditors (-0.001) and positive for non-sanctioned auditors (0.001). As in Italy, in Spain the sanctioned audit firm loses market share, while the non-sanctioned audit firm gains market share (Nagy, 2014). Moreover, sanctioned audit firms lose market share in the year after the disclosure of audit sanction, but their market share does not change in the other years before and after the disclosure of the audit sanction (Aobdia and Shroff, 2017).

The Italian sample includes treated audit firms with a higher level of severity by infringement (1.4 Italy vs 1 Spain on a scale from 1 to 2) and by magnitude (2.867 Italy vs 2.636 Spain on a scale from 1 to 4). Variables at sanction level are always 0 for control firms by construction and are similar in other years for treated firms because they are time invariant. Spanish treated audit firms always receive pecuniary sanctions (100 per cent) and in 90.9 per cent of cases they also receive an additional temporary prohibition. Italian treated audit firms on the other hand receive either pecuniary sanctions (60 per cent) or temporary prohibition (40 per cent).

The mean of ΔPY Market share is negative in Italian treated audit firms (-0.002) while it is 0 in Spanish treated audit firms. It is important to include this control variable in the model because it is very similar to Δ Market share, meaning that the effect on market share could have

appeared previously. The mean of Market share level is higher for Italian treated audit firms (7 per cent) than for Spanish treated audit firms (4 per cent). Finally, Italian treated audit firms have a higher level of Big4 (33.3 per cent) than Spanish treated audit firms (18.2 per cent). In other words, in Italy audit firms sanctioned are larger and Italian Big4 receive more audit sanctions than Spanish Big4.

Client level variables include client size and loss, and are used only in the model that compares sanctioned years with other years. Italian treated audit firms have a higher client size (14.153) than Spanish treated audit firms (10.451) and a higher level of client loss (26.7 per cent vs 9.1 per cent). In other words, clients for which audit firms have received the sanction are larger and have more negative net income in Italy.

[insert Table 3 here]

Table 4 shows the correlation matrix. Potential problems of multicollinearity are for market share level associated with Big4: this could be justified by the high concentration of the Italian audit market. High correlation are for the severity by infringement and by magnitude with the sanctioned treated firm; however, these are the interacted variables in our analysis.

[insert Table 4 here]

4.2.Multivariate tests

Table 5 uses the model of Nagy (2014) in Equation 1a and the model of Aobdia and Shroff (2017) in Equation 1b to test H1, in a setting where audit firm reputation is damaged by audit sanctions. Results show a negative and significant relation between *ΔMarket Share* and *Sanctioned treated firm* (coef. -0.002, p-value 0.070) and *Sanction year t+1* (coef. -0.001, p-value 0.080). The negative and significant coefficient reveals that audit firms, in the year following a public

disclosure of a sanction, lose significantly more (gain significantly less) market share than in other years (Equation 1b) and in comparison with the control group of non-sanctioned firm-year observations (Equation 1a). This suggests that POB audit sanctions are a credible signal of audit failure and supports Hypothesis 1. Extending prior literature to PIE audited by audit firms, this study clarifies the effect of audit sanctions as a measure of audit failure and finds a significant negative effect on market share.

The control variable coefficients are mainly significant in Equation 1b: *Market share level (*coef. 0.100, p-value 0.008), *Big4* (-0.021, p-value 0.005), *Client size* (coef. 0.001, p-value 0.029). *Country fixed effect,* which has value 1 for Spain, shows positive and significant coefficients in Equation 1b (coef. 0.003, p-value 0.020). In other words, the negative association between disclosed audit sanctions and changes of audit firm market share are confirmed both Italy and Spain, as individual countries. We cannot explain differences between countries, because we do not use an interaction for the country fixed effects. All together, these results of control variables mean that independently from the market share level of the audit firm, from the size and the reputation of the audit firm (Big4 vs non-Big4), from the size of the client and from the country (Spain or Italy), our result of H1 is confirmed.

[insert Table 5 here]

Tables 6 (Nagy, 2014 model) and 7 (Aobdia and Shroff, 2017 model) test Hypothesis 2, on whether the type and the severity of the sanction is related to variation in the market share of the sanctioned audit firm-year. Hypothesis 2 is tested with Equation 2a (severity measured by infringement) and Equation 2b (severity measured by magnitude). Results in Table 6 show a

negative and significant association between *ΔMarket Share* and *Severity by infringement* Sanctioned treated firm* (coef. -0.002, p-value 0.037), S*everity by magnitude* Sanctioned treated firm* (coef. -0.001, p-value 0.039). These results confirm Hypothesis 2: audit sanction severity (measured by the Spanish classification – very serious or not– and by the magnitude of the audit sanctions) emphasizes the negative change in audit firm market share. Very serious audit sanctions, high amounts of pecuniary sanctions and longer temporary prohibitions increase the negative change of audit firm market share. Control variable coefficients in this model are not significant.

Results in Table 7 show a negative and significant relation between *ΔMarket Share* and *Severity by magnitude*Sanction year* (coef. -0.0004, p-value 0.077). This result confirms Hypothesis 2 with the model of Aobdia and Shroff (2017): the year after the disclosure of an audit sanction the audit firm suffer a negative change of its market share. The control variable coefficients are mainly significant in Equation 2a e 2b: *Market share level (*coef. 0.101, p-value 0.007 and coef. 0.104, p-value 0.006), *Big4* (coef. -0.021, p-value 0.005, and coef. -0.22, p-value 0.003), *Client size* (coef. 0.001, p-value 0.019, and coef. 0.001, p-value 0.032), Client loss (coef. -0.003, p-value0.079), *Country fixed effect* (coef. 0.003, p-value 0.012, and coef. 0.003, p-value 0.027). All together, these results of control variables mean that independently from the market share level of the audit firm, from the size and the reputation of the audit firm (Big4 vs non-Big4), from the size and performance of the client and from the country (Spain or Italy), our result of H2 is confirmed.

Table 8 tests Hypothesis 3 on whether Big4 has a higher association with the audit market share change than non-Big4 (Equation 3). We test this hypothesis using the model developed by Aobdia and Shroff (2017). The negative (-0.0004) and statistically significant (0.077) coefficient

of the interaction between Big4 and the likelihood of a negative change of the audit market share following the disclosure of an audit sanction confirm our expectation: Big4 yearly market shares have lower increases/larger decreases in market share than those of non-Big4-year market shares. We argue that this higher impact of Big4-audit sanctions on market share is due to their higher level of reputation risk compared with non-Big4 firms. Big4 have much more to lose in terms of reputational brand name than non-Big4. The control variable coefficients are mainly insignificant in Equation 3.

Adj. R2, ranging from 32.8 to 38% for H1 and H2, are better than Adj. R2 in Aobdia and Shroff, 2017 (from 22.5 to 25.4) while are worse for H3 (15.6%). On the other hand, our R2, ranging from 16.5 to 18.4%, are better than Adj. R2 in Nagy, 2014 (13.58%).

[insert Table 6, 7, and 8 here]

7. Summary and conclusion

This study investigates whether DAS by Italian and Spanish POB affect the AFMS. DAS, in fact, is bad news for an audit firm because its informational value can damage auditor reputation and client loyalty, and lower audit fees and market share.

Audit regulation in the EU is tending towards harmonization. In our sample period, in fact, Italy and Spain both adopted Directive 2006/43/EC with the aim of improving audit quality through further empowering POB and raising levels of audit sanctions. National legislation on POB based on the EU directive in both countries was influenced by the US model of audit regulation (Sarbanes Oxley Act of 2002, also known as the "Public Company Accounting Reform and Investor Protection Act"). Like Baker *et al.* (2014) we find that audit regulation in Italy and

Spain underwent a process of mimetic isomorphism. Audit regulation is not fully harmonized in EU countries. However, the EU model tends to copy the US model, even though each country retains natural characteristics including differences related to types, and ranges of audit sanctions.

We find evidence that audit regulation in Spain and Italy has tended to became similar in a process of what neo-institutional theory calls mimetic isomorphism. Starting from this first contribution, the paper investigates the informational value of DAS for the protection of investors.

Prior literature widely studies the effect of disclosed inspection reports from PCAOB, but few papers to date have investigated the effects of audit sanctions as a measure of audit failure on the change in audit market share. Audit failure is a matter for auditors, academics and accounting standard setters (Staubus, 2005) but POB also play a key role in the improvement of audit quality through audit sanctions.

Using data on audit sanctions from Italian and Spanish public oversight boards, this study first tests the effect of sanctions on audit market share. Our findings show that audit sanctions are negatively associated with change in audit firm market share. This means that by imposing audit sanctions, POB help investors to select those high quality auditors able to avoid sanctions, which gives them a market share premium. Another significant result is related to the severity of audit sanctions. Our findings show that very serious audit sanctions, higher pecuniary sanctions and longer temporary prohibitions strengthen the negative effect of sanctions on change in audit firm market share. Finally, we find that the type of audit firm (Big4 vs non-Big4) is also important: belonging to the Big4, in fact, strengthens the negative effect on audit firm market share variation.

We contribute to the literature in several ways. We complement Sundgren and Svanström (2017) who investigate private companies in Sweden finding no significant changes in AFMS, by

finding that audit sanction negatively affect AFMS in Italian and Spanish PIE. Moreover, the paper shows that the severity of an audit sanction can be usefully employed to measure the effect on AFMS change. While Juric *et al.* (2018) investigate the severity of sanctions on accountants, we investigate here the severity of audit sanctions, showing the stronger effects of "very serious" audit sanctions, and audit sanctions of greater magnitude. Finally, we show that Big4 have much more to lose than non-Big4: when an audit sanction involves a Big4, the negative effect on AFMS is higher.

Our findings have implications for academics, professionals, and POB institutions at EU and national level. For academics, our results are a preliminary response to the call for future research made by Baker *et al.*, 2014. Neo-institutional theory in fact explains the tendency of EU audit regulations to become similar, which has uncertain effects on audit quality and investor protection. Academics will be able to use our findings by employing our variables for the measurement of audit sanction severity and the different effect of audit sanctions based on audit firm size. For professionals, the findings sound a warning on audit sanctions. Avoiding them is a key strategy, which should help to assure the audit firm against the loss of reputation, clients, and market share. Finally, our results could be of use for national POB and EU governance in designing and improving audit regulations in EU countries. It may, for example, be helpful for the Italian POB to evaluate whether it is opportune to adopt temporary prohibition as an audit firm sanction, to introduce pecuniary sanctions calculated as percentage of audit fees, or to formally classify the severity of audit sanctions.

Limitations of this research could be related to the following aspects. As dependent variable we use the audit firm market share change and we omit the traditional measures of audit

quality (abnormal accrual, audit fees, audit opinions, financial restatements). The analysis is only on Italy and Spain. The focus is on pecuniary and temporary prohibitions rather than other kinds of audit sanctions. We omit variables that could affect audit market share, such as the audit firm rotation rule in force in Italy and not in Spain. Looking at audit market share, we focus on sanctioned audit firms and we do not study sanctioned audit partners. We are not able to separate the different components of variation in audit market share, such as lowballing and loss of clients. Finally, the measurement of severity by infringements for Italy could be not objective, given that we use the classification from Spanish regulation.

Future research could usefully investigate whether there are sound economic reasons for the differences in audit regulation in EU, and test neo-institutional theory in other countries. Moreover, future research could study audit sanctions in European countries taking into account mandatory auditor rotation (both at audit firm and partner level), the different effects of audit sanctions at partner level, and other possible variables that affect the audit market share variation (e.g. low balling).

Appendix A – Variable definition

Variables	Definition
Dependent variable (time variant variables)	
ΔMarket share	the auditor's market share in year t - auditor's market share in year t-1. An auditor's market share equals the total revenues of an audit firm divided by the sum of the revenues of all audit firms in the country-year.
Variable of interest for the hypothesis (time variant variables)	
Sanction year t+1	1 in the year after a CONSOB/ICAC inspection reports become publicly available via the CONSOB/ICAC website; 0 for other years.
Sanctioned treated firm	1 in the year after a CONSOB/ICAC inspection reports become publicly available via the CONSOB/ICAC website; 0 for control audit firm not sanctioned in that year.
Big4	1 if the audit firm is Deloitte, ErnstandYoung, KPMG, PriceWaterhouseCooper; 0 otherwise. Data from the sanction document.
Sanction level (time invariant variables)	
Severity by infringement	2 for a sanction classified "very serious" in the Spanish document (classification defined by law) and if it is included in the definition of "very serious" for the Italian sanction (classification applied by the authors in coherence with Spain); 1 for a sanction as classified "serious"; and 0 if the sanction is not present (for control firms). Data from the sanction document.
Severity by magnitude	4 if the distance from the maximum sanction is in the first quartile; 3 if the distance from the maximum sanction is in the second quartile; 2 if the distance from the maximum sanction is in the third quartile; 1 if the distance from the maximum sanction is in the fourth quartile; and 0 if the sanction is not present (for control firms). A higher quartile indicates a lower distance from the maximum and so a higher severity. Distance from the maximum is measured as 36 (18) months minus the number of months of the temporary prohibition for Spain (Italy) and as 387,753 (350,000) euro minus the amount of the pecuniary sanctions for Spain (Italy).
Control variables **Audit firm level (time variant variables)**	
ΔPY*Market share*	one-year lag variable of *ΔMarket share*
Market share level	auditor's market share
Client level (time invariant variables)	
Client size	natural logarithm of total assets of the year of the financial statement that received the sanction. Data hand collected. Descriptive statistics show also the amount in euro.
Client loss	negative income before extraordinary items
Country level (time invariant variables)	
Country fixed effect	1 if the audited firm is located in Spain; 0 otherwise. Data from the sanction document.

Appendix B – Example of extracts from CONSOB, ICAC and PCAOB report (our English translation)

Extracts from CONSOB report (example) - Resolution no. 14375
Notice to KPMG spa not to use the activity of auditing, for a period of two years, of Dr. Mauro Daniel Borghini

THE NATIONAL COMMISSION FOR THE COMPANIES AND THE SECURITIES

Considering the regulation number …

Considering the **non correct application of** …

DECIDES

To instruct, pursuant to art.163, first paragraph, letter a), of Legislative Decree 24 February 1998, no. 58, to the auditing company KPMG SpA. **not to use for the activity of auditing**, for a period of **two years** from the date of notification of the present document, Mr. Mauro Daniel Borghini.
This provision will be notified to the aforementioned auditing company and to Dr. Mauro Daniel Borghini in the manner and terms of the law and published in the CONSOB bulletin.
The present provision can be challenged before the T.A.R. of Lazio within sixty days of its notification.

President
Lamberto Cardia

Extracts from ICAC report (example) - Resolution of January 7, 1994, of the Institute of Accounting and Audit of Accounts, whereby society is sanctioned account audit Coopers and Lybrand, S.A.

Resulting from prior steps …

Considering other points and the **non correct application of** …

For all these reasons, this Institute of Accounting and Auditing of Accounts, **DECIDES:**

First: To declare the Audit Society Coopers and Lybrand, S.A.responsible for the commission of **a serious breach** of those contemplated in section c) of article 16.2 of Law 1911988, of July 12, having committed a case of non-compliance with audit standards that may cause economic damage to third parties or to the company or entity audited.

Second: Impose consequently a **pecuniary sanction** for the amount of thirty-eight million four hundred ninety thousand nine hundred sixtheen pesetas (38.490.916, -), equivalent to one with twenty-five percent of the fees invoiced by the company in the last closed exercise, according to the information sent to the Institute, which will be recorded in full in the Official Register of Account Auditors and published in the Bulletin of this Institute once it has gained firmness in administrative channels.

The President of the Accounting and Audit Institute
Ricardo Bolufer Nieto

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Table 1 - Audit sanctions (Pecuniary and Temporary Prohibition) in Spanish and Italian law for Public Interest Entities

	Directive 2006/43/EU		
	Spain		Italy
Pecuniary Sanctions	**Law 12/2010, art. 17**		**Legislative Decree 39/2010, art. 26, a)**
	Very Serious	**Serious**	
Audit firms	3 to 6% audit fees, starting from 24000 €	3% audit fees, starting from 12000 €	10000≤ € ≤ 500000 or 100000≤ € ≤ 500000 (when the independence principle is violated)
Partner	12001 <€ ≤24000	from 3000 € to 12000	

	Law 12/2010, art. 17		**Legislative Decree 39/2010, art. 26, d)**
	Very Serious	**Serious**	
Temporary prohibitions	2<Years ≤5	≤ 2Years	≤3 Years (limited to new audit engagement) ≤5 Years

Table 2 – Sample

Observations used in the regression analysis (Nagy, 2014 model) N=30 in Italy and 22 in Spain=52			
Italy (N=30)			
Treated firms	**Sanction year t+1 (N=15)**	**Control firms**	**Sanction year t+1 (N=15)**
EandY	2015	PWC	2015
Bompani	2012 and 2014	Trevor	2012 and 2014
Deloitte	2012 and 2016	PWC	2012 and 2016
Iter Audit	2013	Axis	2013
KPMG	2015 and 2016	PWC	2015 and 2016
Mazars-BDO	2012 and 2013 and 2015 and 2016	Fidital	2012 and 2013 and 2015 and 2016
PKF	2015	Audirevi	2015
RSM	2013	Analisi	2013
Ria and Partners	2013	Baker Tilly	2013
Total observations	*15*		*15*

Note: PWC has 2015 and 2016 twice in the sample

Spain (N=22)			
Treated firms	**Sanction year t+1 (N=11)**	**Control firms**	**Sanction year t+1 (N=11)**
Agem	2014	Opinia	2014
Auditores Inmobiliarios	2013	ATD	2013
Auditores Valencianos	2015	Imafiel	2015
Cic Audit	2014	Arribas	2014
EandY	2014	PWC	2014
Gassó	2013	Horwath	2013
Gesem	2013	Auditglobal	2013
KPMG	2011	Deloitte	2011
Russell Bedford	2011	Capital	2011
Uniaudit	2015 and 2016	PKF	2015 and 2016
Total observations	*11*		*11*

Years used in the regression analysis (Aobdia and Shroff, 2017 model) N=63 in Italy and 65 in Spain=128		
Italy (N=63)	**Sanction year t+1 (N=15)**	**Other years (N=48)**
EandY	2015	2010-2011-2012-2013-2014-2016
Bompani	2012 and 2014	2010-2011-2013-2015-2016
Deloitte	2012 and 2016	2010-2011-2013-2014
Iter Audit	2013	2010-2011-2012-2013-2014-2015-2016
KPMG	2015 and 2016	2010-2011-2012-2013-2014
Mazars-BDO	2012 and 2013 and 2015 and 2016	2010-2011-2014
PKF	2015	2010-2011-2012-2013-2014-2016
RSM	2013	2010-2011-2012-2014-2015-2016
Ria and Partners	2013	2010-2011-2012-2014-2015-2016
Total observations	*15*	*48*

Spain (N=65)	**Sanction year t+1 (N=11)**	**Other years (N=54)**
Agem	2014	2012-2013-2015-2016
Auditores Inmobiliarios	2013	2010-2011-2012-2014-2015-2016
Auditores Valencianos	2015	2010-2011-2012-2013-2014-2016
Cic Audit	2014	2010-2011-2012-2013-2015-2016
EandY	2014	2010-2011-2012-2013-2015-2016
Gassó	2013	2010-2011-2012-2014-2015
Gesem	2013	2010-2011-2012-2014-2015-2016
KPMG	2011	2010-2012-2013-2014-2015-2016
Russell Bedford	2011	2010-2012-2013-2014
Uniaudit	2015 and 2016	2010-2011-2012-2013-2014
Total observations	*11*	*54*

Note: We collect sanctions from 2007 and financial statement data for audit firms from 2009, but the model can start from 2010 given that we need to compute the change with t-1. The last year for which we hand collect the sanction data is 2015, so the last usable year is 2016. If an audit firms received a sanction and we have missing data for revenues for the full period, we exclude this audit firm from the sample. Note: If an audit firm receives more than 1 sanction in one year, we keep only the most severe one. (6 audit firms in Italy and 5 in Spain). Other years are not complete till 2016 for all audit firms because some of them went bankrupt.

Table 3 – Descriptive statistics

	Sanction year t+1 Treated audit firms		Sanction year t+1 Control audit firms (Nagy, 2014)		Other years Treated audit firms (Aobdia and Shroff, 2017)	
PANEL A - Italy	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Dependent variables						
ΔMarket share	-0.002	0.004	0.002	0.006	0.000	0.005
Variables of the hypothesis						
H1 - Sanction year t+1	1.000	0.000	.	.	0.000	0.000
H1 - Sanctioned treated firm	1.000	0.000	0.000	0.000	1.000	0.000
H2 - Severity by infringement	1.400	0.507	0.000	0.000	1.298	0.462
H2 - Severity by magnitude	2.867	1.187	0.000	0.000	2.638	1.131
H3 - Big4	0.333	0.488	0.333	0.488	0.333	0.476
Control variables						
Audit firm level						
ΔPY Market share	-0.002	0.003	0.004	0.006	0.000	0.005
Market share level	0.070	0.100	0.097	0.136	0.078	0.108
Client level						
Client size	14.153	1.549	.	.	14.836	1.621
Client loss	0.267	0.458	.	.	0.383	0.491

	Sanction year t+1 Treated audit firms		Sanction year t+1 Control audit firms (Nagy, 2014)		Other years Treated audit firms (Aobdia and Shroff, 2017)	
PANEL B - Spain	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Dependent variables						
ΔMarket share	-0.001	0.001	0.001	0.002	0.000	0.003
Variables of the hypothesis						
H1 - Sanction year t+1	1.000	0.000	.	.	0.000	0.000
H1 - Sanctioned treated firm	1.000	0.000	0.000	0.000	1.000	0.000
H2 - Severity by infringement	1.000	0.000	0.000	0.000	1.000	0.000
H2 - Severity by magnitude	2.636	0.924	0.000	0.000	2.727	0.932
H3- Big4	0.182	0.405	0.182	0.405	0.222	0.420
Control variables						
Audit firm level						
ΔPY Market share	0.000	0.003	0.001	0.003	0.000	0.004
Market share level	0.040	0.089	0.072	0.172	0.046	0.090
Client level						
Client size	10.451	1.665	.	.	10.524	1.634
Client loss	0.091	0.302	.	.	0.109	0.315

See Appendix 1 for variable definition.

Table 4 – Correlation matrix

		1	2	3	4	5	6	7	8	9	10
1	ΔMarket share	1.000									
2	Sanction year t+1	-0.140	1.000								
3	Sanctioned treated firm	-0.165	.	1.000							
4	Severity by infringement	-0.249	0.102	0.795	1.000						
5	Severity by magnitude	-0.166	0.030	0.735	0.808	1.000					
6	Big4	0.032	-0.005	0.004	0.044	0.271	1.000				
7	ΔPY Market share	0.313	-0.069	-0.209	-0.294	-0.250	0.061	1.000			
8	Market share level	0.205	-0.016	-0.089	-0.070	0.142	0.937	0.176	1.000		
9	Client size	0.101	0.006	.	0.131	0.066	0.194	0.069	0.230	1.000	
10	Client loss	0.218	-0.044	.	-0.182	0.193	0.504	0.216	0.644	0.476	1.000

See Appendix 1 for variable definition.

Table 5 – Test of H1 – Audit sanction effect

Dependent variables: **ΔMarket share**	**Equation 1a Nagy (2014)**		**Equation 1b Aobdia an Shroff (2017)**	
	Estimate	**P-value**	**Estimate**	**P-value**
Sanctioned treated firm	**-0.002**	**0.070**		
Sanction year t+1			**-0.001**	**0.080**
ΔPY Market share	0.238	0.111	0.051	0.709
Market share level	0.006	0.201	0.100	0.008
Big4			-0.021	0.005
Client size			0.001	0.029
Client loss			-0.003	0.122
Country fixed effect	0.001	0.603	0.003	0.020
Constant	0.000	0.837	-0.009	0.021
Adj. R2	0.165		0.328	
Obs.	52		128	

See Appendix 1 for variable definition.

Table 6 – Test of H2 – Severity effect - Nagy (2014)

Dependent variables: ΔMarket share	**H2- Equation 2a**		**H2- Equation 2b**	
	Estimate	**P-value**	**Estimate**	**P-value**
Severity by infringement* Sanctioned treated firm	**-0.002**	**0.037**		
Severity by magnitude* Sanctioned treated firm			**-0.001**	**0.039**
ΔPY Market share	0.216	0.146	0.215	0.150
Market share level	0.006	0.198	0.007	0.134
Country fixed effect	0.000	0.859	0.001	0.647
Constant	0.000	0.668	0.000	0.845
Adj. R2	0.184		0.182	
Obs.	52		52	

See Appendix 1 for variable definition.

Table 7 – Test of H2 – Severity effect - Aobdia and Shroff (2017)

Dependent variables: ΔMarket share	**H2- Equation 2a**		**H2- Equation 2b**	
	Estimate	**P-value**	**Estimate**	**P-value**
Severity by infringement* Sanction year t+1	**-0.001**	**0.129**		
Severity by infringement	**0.001**	**0.517**		
Severity by magnitude* Sanction year			**-0.0004**	**0.077**
Severity by magnitude			**0.0004**	**0.158**
ΔPY Market share	0.051	0.712	0.052	0.701
Market share level	0.101	0.007	0.104	0.006
Big4	-0.021	0.005	-0.022	0.003
Client size	0.001	0.019	0.001	0.032
Client loss	-0.003	0.109	-0.003	0.079
Country fixed effect	0.003	0.012	0.003	0.027
Year fixed effect	included		included	
Constant	-0.010	0.014	-0.010	0.012
Adj. R2	0.373		0.380	
Obs.	128		128	

See Appendix 1 for variable definition.

Table 8 – Test of H3 - Big4 effect

Dependent variables: ΔMarket share	**H3- Equation 3- Aobdia an Shroff (2017)**	
	Estimate	**P-value**
Sanction year t+1	**0.0003**	**0.367**
Big4*Sanction year t+1	**-0.005**	**0.038**
ΔPY Market share	0.231	0.058
Market share level	0.003	0.741
Client size	0.0003	0.238
Client loss	0.001	0.329
Country fixed effect	0.002	0.134
Constant	-0.006	0.152
Adj. R2	0.156	
Obs.	128	

See Appendix 1 for variable definition.

Figure 1 – Neo Institutional Theory, Literature review and Hypothesis development