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EFFECT OF JOINT AUDITOR PAIR ON CONSERVATISM: EVIDENCE FROM IMPAIRMENT TESTS

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Résumé : A partir d'un échantillon de sociétés en France, où la loi exige deux auditeurs, nous examinons l'effet de la composition des paires d'auditeurs sur des mesures générales du conservatisme non-conditionnel et conditionnel, ainsi que sur une mesure spécifique du conservatisme conditionnel : la charge d'impairment. Nous nous appuyons sur la théorie des jeux pour démontrer que les paires d'auditeurs Big 4–Big 4 soumis aux mêmes intérêts, sont susceptibles d'avoir un degré d'indépendance plus faible, conduisant à un degré de conservatisme plus inférieur. Inversement, les paires d'auditeurs Big 4 et non-Big 4 augmente l'intérêt de l'auditeur Big 4 d'être plus conservateur. Nous mettons empiriquement en évidence que les paires Big 4–Small sont associées à plus de conservatisme non-conditionnel et conditionnel en utilisant le ratio market-to-book et la mesure de Basu (1997), et que les paires Big 4–Small enregistrent davantage de dépréciations adéquates et sont plus transparentes. Nos résultats sont intéressant pour les régulateurs à travers le monde qui envisagent le co-commissariat afin d'accroître la qualité de l'audit

Mots clés : Co-commissariat – Reconnaissance adéquate des pertes – Dilemme du prisonnier – Qualité de l'audit

Abstract: Using a sample of firms from France, where the law requires use of two auditors, we examine the effect of auditor pair composition on overall measures of unconditional and conditional conservatism, as well as on a specific measure of conditional conservatism, i.e., impairment loss. We use game theory to demonstrate that pairs of Big 4 auditors facing similar incentives are likely to have lower auditor independence, leading to lower conservatism. Conversely, pairs of a Big 4 and a Small auditor increase Big 4 auditors' incentives to be conservative. We document that Big 4–Small auditor pairs are more unconditionally and conditionally conservative using market-to-book ratio and Basu's (1997) measure of conservatism, are more likely to book impairments when operating performance is low, and make more transparent impairment-related disclosures. Our results inform regulators who are considering requiring joint audit to improve audit quality.

Keywords: Joint Audit – Conservatism – Timely Loss Recognition – Impairment Test - Prisoner's Dilemma – Audi Quality

1. Introduction

The recent financial crisis has led regulators and others to question whether audit firms lack "the requisite independence, expertise and incentives to construct the promised 'true' and 'fair' account of corporate affairs" (Sikka 2009, 868). As a result, regulatory authorities around the world have proposed solutions aimed at improving audit firms' ability to detect and prevent corporate bankruptcies, frauds and failures. The European Commission, in its Green Paper released in 2010, proposed the use of joint audits to improve audit quality and reduce audit market concentration. Similar initiatives have been proposed by regulatory authorities in the UK, India and China. These proposals have resulted in widespread debate about the benefits and costs of joint audit. In this study, we examine whether and how joint audits can improve audit quality.

Assessing the costs and benefits of joint audits requires evaluating their effect on audit quality. DeAngelo (1981) defines audit quality as the market-assessed joint probability that a given auditor will both discover a breach in an accounting system and report the breach. In other words, audit quality is a function of the auditor's ability to detect material misstatements (auditor competence) and the auditor's willingness to report discovered material misstatements (auditor independence). Joint audit could positively affect both components of audit quality. Holding independence constant, a joint audit could increase the probability of detecting material misstatements because having another auditor review the work could increase the probability of detecting the problem. Advocates of joint audit also argue that joint audit benefits from complementarities of expertise and geographical coverage between the two auditors, and enhances dialogue leading to better solutions for problems in which judgment needs to be exercised (Mazars 2010). Holding competence constant, joint audit could induce a higher level of auditor independence for the following reasons. First, it weakens the economic bonding between the auditor and the client because of fee sharing between the auditors (Mazars 2010; Zerni et al. 2012). Second, it reduces the risk of collusion between the client and the auditor because it involves three entities instead of two. As long as the benefits of taking corrective action exceed the costs for any one auditor, the problem will be reported and corrected (Zerni et al. 2012, 4). Third, it preserves knowledge resulting from staggered auditor appointments. Joint auditors usually rotate at different times, which will likely increase auditor independence while ensuring continuity by preserving the auditors' knowledge of the auditee (Carcello and Nagy 2004).

However, a joint audit may also negatively affect audit quality. First, a joint audit potentially entails high organization and coordination costs, which may lead to free riding by one or both members of the audit team. Second, inappropriate cooperation during the audit could lead to insufficient information exchange between the two auditors and *in fine* to lower audit quality (Neveling 2007). Third, as noted by Deng et al. (2012), joint audit may result in internal opinion shopping by the client.

The extant empirical evidence on the effect of joint audit on audit quality confirms the mixed theoretical predictions. First, in 2004, when Denmark switched from a mandatory joint audit regime to a voluntary one, only 24 percent of publicly traded firms in Denmark retained the joint audit structure, revealing a market preference for single auditors (Thinggaard and Kiertzner 2008). On the other hand, in the context of voluntary joint audits in Sweden, Zerni et al. (2012) find evidence consistent with higher audit quality resulting from joint audits.

Second, while Francis et al. (2009) show that firms with two Big 4 auditors in France have smaller income-increasing abnormal accruals, Marmousez (2009) reports that firms with two Big 4 auditors are less conservative in reporting bad news. These conflicting results suggest that, in addition to the audit regime itself, the composition of the auditor pair in a joint audit may differentially affect audit quality. Therefore, drawing general conclusions about the effect of joint audits on audit quality may not be straightforward. Audit quality may differ across different auditor pairs (e.g., two Big 4 firms, one Big 4 paired with one non-Big 4, two non-Big 4) because the interactions between different auditors are likely to alter the effects of joint audit on both the competence and independence dimensions of audit quality.

Informing the debate on the adequacy of joint audits requires asking, at a minimum, the following two questions: (1) Should a firm opt for one or two auditors? (2) If a firm chooses two auditors, how many Big 4 auditors, if any, should be selected? Answering both questions in a single study requires isolating the self-selection effects associated with the choice between single and joint audit under a voluntary regime from the effects related to the choice of joint audit composition. To focus the analysis and provide more direct evidence, we choose to examine only the second question in a mandatory joint audit regime.

We investigate this question in France, where the regulatory setting presents a unique opportunity for assessing the effectiveness of different audit pairs, as publicly listed companies preparing consolidated financial statements have been required to be audited by (at least) two unrelated auditors since 1966. In the French audit market we observe a variety of audit pairs including Big 4–Big 4, Big 4–non-Big 4, and non-Big 4–non-Big 4. The audit quality of these pairs is likely to be affected by the competence and the relative bargaining power and reputation costs of each member in the pair.

A Big 4 auditor may bear higher risks when paired with a non-Big 4 auditor than when paired with another Big 4 auditor. When a Big 4 auditor is paired with a non-Big 4 auditor, the cost of litigation and loss of reputation in case of audit failure is likely to be largely borne by the Big 4 auditor, whereas such costs are more equitably shared when two Big 4 auditors are paired together, because both have deep pockets. In a noteworthy legal case in 2007, French securities regulators (AMF)[1] found evidence of misstatements in the financial statements of the company Marionnaud for the period 2002-2004. Marionnaud was audited by a Big 4–non-Big 4 pair consisting of KPMG and Cofirec. However, the AMF held KPMG responsible for the misstatements, claiming that the small auditor "had neither the resources nor the ability" to detect the irregularities in its cross review. The disproportionately high risk borne by a Big 4 auditor when paired with a small auditor creates stronger incentives for the Big 4 auditor to enforce appropriate financial reporting.

We use a simple game theory model that takes into account strategic interactions among joint auditors to predict the level of auditor independence across different auditor pairs. We show that because both auditors share similar reputation and litigation costs associated with an audit failure when a Big 4 auditor is paired with another Big 4 auditor, it leads to the prisoner's dilemma solution and lower auditor independence. By contrast, a Big 4–non Big 4 auditor pair possesses higher auditor independence as the Big 4 auditor bears most, if not all, of the reputation and litigation costs associated with an audit failure (as illustrated by the

[1]The AMF ('Autorité des marchés financiers' – 'Financial Market Authority') is the French equivalent of the SEC.

KPMG-Cofirec auditor pair). In other words, although the Big 4–non-Big 4 pair is likely to have lower auditor competence, it may have higher auditor independence than the Big 4–Big 4 auditor pair. As a result, the overall effect of auditor pair composition on audit quality is unclear and remains an empirical question.

We first assess the implications of auditor pair composition for financial reporting quality, proxied by general measures of both unconditional and conditional conservatism. Auditors, through their monitoring role, influence the outcome of financial reporting by firms. Better monitoring translates into higher audit quality and more transparent financial reporting, as measured by the extent of earnings management, likelihood of bankruptcy or restatements, and degree of conservatism in financial reporting. In addition to using overall measures of conservatism in evaluating the effects of joint audit pair composition on audit quality, we also rely on a procedure-specific measure of conservatism, namely impairment tests. Under both international accounting standards and US GAAP, impairment tests are crucial to guarantee timely loss recognition, as impairment tests ensure that assets are not carried at more than their economic value (also referred to as recoverable value (IASB 2004)). International Financial Reporting Standards, applicable in France since 2005, require that an impairment loss be recognized whenever the recoverable amount is below the carrying amount (IAS 36§59). The implementation of impairment tests usually relies on valuation models, requires "significant judgment" from managers (Petersen and Plenborg 2010, 420), and is prone to manipulation by managers because it relies on unverifiable fair value estimates (Hayn and Hughes 2006; Ramanna 2008; Li and Sloan 2011; Ramanna and Watts 2012). Disclosures of the subjective valuation assumptions used in impairment tests also vary widely (ESMA 2013). Consequently, the role of auditors in maintaining objectivity and transparency of impairment tests and taking corrective action to ensure that firms recognize economic impairments when they occur is more pronounced.

Focusing on the relation between auditor pair composition and goodwill impairment has several advantages over studying the corresponding relations between more general measures of unconditional and conditional conservatism. First, general unconditional and conditional conservatism measures such as market-to-book ratio and the Basu asymmetric timeliness measure are affected by many factors that are difficult to properly control. Focusing on a specific account can potentially offer sharper and more powerful tests of the effect of auditor pairs. Second, impairment tests play a key role in ensuring timely loss recognition and hence conservatism. Examining the impairment accounts allows us to observe the underlying mechanism through which auditor pairs affect conservatism. Third, the impairment account is more prone to manipulation due to the subjectivity associated with estimating fair values. If auditor pair composition has an effect on accounting quality, this effect should be most noticeable in an account such as impairment where the auditor's role in monitoring management behavior is important. Fourth, the impairment account is usually economically significant because it is related to a public firm's largest individual asset for which a "fair value" estimate is required, i.e., goodwill.[2] Fifth, transparency of impairment-related disclosures allows us to infer the effects of auditor independence, as the decision regarding whether or not to enforce disclosures is mainly affected by auditor independence.

[2] From 2006 to 2009, goodwill represents on average 27% of total assets of the 120 French largest listed firms (SBF 120) composing our sample.

We conduct our empirical analysis on a sample consisting of all non-financial French firms included in the SBF 120 index (the 120 largest market cap firms listed on the Paris Bourse) over the period 2006 to 2009. After controlling for auditor pair choice, we document the following results. First, firms audited by a Big 4–non-Big 4 auditor pair exhibit a higher degree of unconditional conservatism, proxied by (growth-adjusted) market-to-book ratio. Second, firms audited by a Big 4–non-Big 4 auditor pair exhibit a higher degree of conditional conservatism, proxied by the Basu (1997) asymmetric timeliness measure. Third, firms audited by a Big 4–non-Big 4 auditor pair are more likely to impair assets when operating performance is low. Fourth, impairment-related disclosures of firms audited by a Big 4–non-Big 4 auditor pair become more transparent when operating performance is poor, whereas firms audited by a Big 4–Big 4 auditor pair exhibit a reduction in transparency. Overall, our results indicate higher levels of conservatism for firms audited by a Big 4–non-Big 4 auditor pair than for firms audited by a Big 4–Big 4 auditor pair. These results are consistent with the predictions of our game theory model of higher independence among Big 4–Small auditor pairs. They also indirectly suggest that auditor independence plays a more prominent role than auditor competence in explaining the observed difference in level of conservatism across different auditor pairs. When Big 4 auditors are paired with non-Big 4 auditors, they are more likely to force firms to be conservative and conduct objective impairment tests because Big 4 auditors bear a disproportionately larger share of reputation and litigation costs.

We make several contributions to the literature. First, we deepen the understanding of the consequences of the joint audit requirement for audit quality. Our findings are relevant to the debate on audit reforms being considered by policy makers around the world in their efforts to improve audit quality. Second, we demonstrate that strategic interactions between joint auditors have important implications for audit quality. To the best of our knowledge, ours is the first study to use game theory to study joint audit. Third, we challenge the common belief that two Big 4 auditors necessarily improve financial statement quality. Considering the effect of strategic interactions between joint auditors on independence, we provide evidence on the effect of risk sharing between joint auditors on financial statement quality, in particular conservatism, which is important for assessing the potential benefits of joint audit.

The remainder of this paper is organized as follows. We provide a description of the audit market in France in section II, review the related literature in section III, and develop the hypotheses in section IV. We describe the data and empirical methods used, and report our findings in section V, before concluding the study in section VI.

2. The audit market in France

Since 1966, public firms in France are required to be audited by (at least) two distinct auditors that share the audit process. Although threatened by the European regulation introducing consolidated financial reporting in 1984, this joint audit requirement was reiterated by the 2003 French Financial Security Law that followed the Enron scandal.[3]

[3]French Financial Security Law (2003). « Loi No 2003-706 du 1 août 2003 de sécurité financière, version consolidée au 1er avril 2006 », available at http://www.legifrance.gouv.fr. Francis et al. (2009, 38) also provides specifics of the audit market in France.

Auditors have a six-year mandate and face (for mandates of listed firms) a compulsory (partner) rotation after each mandate if the same audit firm is retained. Joint auditors share the workload and associated fees in conducting the audit process according to quantitative criteria (e.g., number of estimated hours) and qualitative criteria (e.g., expertise required). French Financial Security Law also requires that each joint auditor verifies verify the work undertaken by the other auditor leading to the joint audit report. Therefore, the joint audit is not a double audit where each auditor duplicates its counterpart's work. Instead, joint auditors must sign a single audit report, i.e., agree on the same report independently, and are legally jointly liable for the issued audit opinion. However, as indicated earlier, the actual liability may be different from the legal rule as regulators are likely to differentially treat large and small audit firms.

Joint audit is being considered by the European Commission as an option to restore confidence in the financial statements of companies after the 2008 financial crisis, and also as a way to decrease audit market concentration. As Michel Barnier, Internal Market and Services Commissioner, explains "[The European Commission]'s proposals[4] address the current weaknesses in the EU audit market, by eliminating conflicts of interest, ensuring independence and robust supervision, and by facilitating more diversity in what is an overly concentrated market, especially at the top-end." One of the European Commission's main arguments favoring joint audit is that it will facilitate the emergence of new "Big" audit firms, in particular by promoting Big 4–non-Big 4 auditor pairs.

France has the lowest concentration in the audit sector among G8 countries, where Big 4 auditors earned only 61% of total market revenues in 2007 compared to 91% for the other G8 countries.[5] One consequence of the joint audit rule is that, even if the Big 4 dominate the audit market, smaller audit firms also play a significant role in the audit market. Indeed, 55% of our sample that spans the 2006-2009 period and represents the 120 largest non-financial firms by market cap, were audited by at least one non-Big 4 auditor.[6] Non-Big 4 auditors can be classified into two sub-groups: (1) Tier-one non-Big 4 auditors, which have considerable revenues, more than one listed-firm client, and belong to an international network, e.g., Mazars, Grand Thornton and BDO, and (2) Tier-two non-Big 4 auditors, which have considerably smaller revenues, usually only one listed firm client, and are mainly local French auditors, e.g., AEG Finance, Cofirec, Dauge & Associés, Didier Kling & Associés. There are relatively few joint auditor pairs comprised only of Tier-one and/or Tier-two non-Big 4 auditors.

3. Overview of related literature

Research attempting to model the joint audit is scarce. An exception is Deng et al. (2012), who develop a model that compares three regimes -- a Single Big-Firm Auditor (regime B), Two Big-Firm Auditors (regime BB), and One Big-Firm Auditor paired with one Small-Firm Auditor (regime BS) -- to assess the effect of joint audit on audit fees, audit evidence precision, and auditor independence. Their results indicate that audit evidence precision is the

[4](European_Commission 2011a, 2011b)
[5] http://www.gti.org/Press-room/Press-archive/2007/G8-audit-concentration.asp
[6] See the descriptive statistics in Table 2, Panel B.

same for regimes B and BB, but lower for regime BS, as the small audit firm free rides on the big firm. In addition, joint audit lowers auditor independence for both regimes BB and BS. Although buying off two auditors is more expensive under joint audit, joint audits provide companies with an opportunity to internally shop for a favorable audit opinion from the two auditors and thus lead to a higher level of *ex post* earnings management. In terms of audit fees, the BB regime would result in lower audit fees than the B regime because of the convexity of the resource cost function (i.e., one audit firm doing all the work under a completion time constraint may experience a higher cost than if the work was split between two firms). The audit fee for the BS regime would be lower than under the B regime only if the big firm and the small firm have similar technological efficiency or if the big firm bears a sufficiently large proportion of misstatement cost. In general, the results indicate that, in contrast to the common view, joint audit does not necessarily improve auditor competence or independence due to free-riding and internal opinion shopping. Audit fees are also not necessarily higher when compared to single audit.

Empirical evidence comparing the performance of joint audit and single audit is limited, with most studies examining the effect of voluntary joint audit. For example, Zerni et al. (2012) study the impact of voluntary joint audit on audit quality in Sweden. While controlling for differences in characteristics between firms voluntarily choosing joint audits and other firms, the authors demonstrate that joint audits improve audit quality. Using a sample of approximately 900 firm-year observations, Zerni et al. (2012) show that firms using joint audit have higher conservatism as measured by the asymmetric timeliness coefficient, lower income-increasing abnormal accruals, higher credit ratings, and lower perceived risk of bankruptcy. However, audit fees are significantly higher for joint audit firms. Our study differs from Zerni et al. (2012) in terms of both research objective and context. We focus on the consequences of auditor pair composition on audit quality in a mandatory joint audit context.

Lesage et al. (2011) test the impact of joint audit on both audit cost and audit quality in Denmark (2005-2009), which rescinded the mandatory joint audit requirement in 2005. They find that firms continuing to use joint audit after the 2005 regulation change have significantly higher audit fees compared with firms voluntarily choosing to use a single auditor, but no difference in total fees. In addition, audit quality, proxied by abnormal accruals, is not significantly different for the joint and single audit firms.

André et al. (2013) examine the impact of mandatory joint audit on both audit costs and audit quality across different countries. They compare audit fees paid by French listed firms under the mandatory joint audit regime to audit fees paid by Italian and British firms under the single audit regime. Their findings indicate higher audit fees in France after controlling for auditor, client and engagement attributes. Using abnormal accruals, they do not find significantly higher audit quality under the joint audit regime.

Francis et al. (2009) analyze the consequences of France's joint audit requirement on earnings quality for a sample of 261 firm-year observations and find that firms with two Big 4 auditors exhibit lower income-increasing abnormal accruals than firms with no Big 4 auditors. Firms with a Big 4 auditor paired with a non-Big 4 auditor also have lower income increasing abnormal accruals; however the difference is not as large as the difference for firms with two Big 4 auditors. Francis et al. (2009) conclude that a pecking order exists with regard to earnings quality and auditor-pair choice. Our evidence, using conservatism as the measure of

quality, does not support Francis et al.'s pecking order. In addition, by considering the effect of strategic interactions between auditors on auditor independence, we question whether the pair of two Big 4 auditors is necessarily better than the pair of a Big 4 and a non-Big 4 auditor.

Using a sample of 177 firms in 2003 and Basu's (1997) measure of conservatism, Marmousez (2009) finds that Big 4–Big 4 auditor pairs are not associated with conditional conservatism whereas Big4–non-Big 4 auditor pairs are. According to Marmousez (2009), the rationale for these results is that interactions between Big 4 auditors are less efficient and reduce incentives to provide an adequate effort for Big 4 pairs. Our study adds to this exploratory work in three ways. First, relying on a game theory model, we provide a formal background and explanation for the results. Second, by using a different time-period and a larger sample, we test the effect of auditor pair composition on unconditional conservatism and timely impairment loss recognition and find consistent results. Third, using self-constructed transparency measures for impairment-related disclosures, we attempt to examine the effect of auditor pair composition on auditor independence.

We complement prior research by focusing on accounting procedures that are essential to achieve conservatism but likely to be manipulated by managers, i.e., impairment tests. Impairments of assets are typically perceived as a negative asset pricing signal by market participants (Fields et al. 2001), which provides a strong incentive for firms to avoid booking or delaying their recognition. There are also other incentives for managers to avoid or delay impairment recognition including debt and compensation contracts (Watts and Zimmerman 1986) and management reputation (Francis et al. 1996). These incentives, along with the increased flexibility afforded managers by recent accounting standards (i.e., IAS 36 (IASB 2004) internationally and FAS 142 (FASB 2001) in the US) explain Li and Sloan (2011) or Ramanna and Watts (2012) findings of a high degree of manipulation by managers of asset impairments. Hayn and Hughes (2006) document a time lag of three to four years between the deterioration in the performance of the acquired business that gave rise to goodwill and the actual recognition of goodwill impairment. Petersen and Plenborg (2010), using a survey on 58 firms listed on the Copenhagen Stock Exchange, identify numerous areas of non-compliance with IAS 36 "Impairment of assets" for these firms and show that "practice varies considerably among firms" (p. 421). The authors also stress that "IAS 36 is a standard that involves substantial judgment" (p. 420). The European Securities and Market Authority (ESMA) also recently expressed concern about insufficient impairment recognition and disclosures by major listed European companies during the financial crisis, stating that "Although the major disclosures related to goodwill impairment testing were generally included, in many cases these were of a boiler plate nature and not entity-specific"(ESMA 2013, 3). The financial and sovereign debt crisis experienced by European firms since the summer of 2007 offers an excellent setting for examining impairment tests, since economic impairments were frequent over the period. External auditors play a key role in maintaining the objectivity and fairness of impairment tests, particularly with regard to their accuracy and transparency (Petersen and Plenborg 2010, 419).

The level of conservatism resulting from the joint audit can be viewed as the outcome of a non-cooperative game between the two auditors. Prior research has used game theory to describe relations between a firm and its (single) auditor (e.g., Demski and Swieringa 1974; Fellingham and Newman 1985; Antle and Nalebuff 1991; Matsumura and Tucker 1992;

Hatherly et al. 1996; Cook et al. 1997). To our knowledge, game theory has never been used to model strategic interactions between joint auditors.

4. Development of hypotheses

Our objective is to examine how the types of auditors in the pair affect audit quality. Since the characteristics of the auditors in the pair dictate their incentives, projected payoffs and ultimate actions in the three-player game, we need to analyze the effects of auditor type to understand the audit quality implications of joint audit. A considerable amount of the audit literature distinguishes between Big 4 and non-Big 4 auditors for at least the following two reasons. First, auditor size is viewed as a proxy for audit quality because lower economic reliance on any single client makes larger audit firms less likely to behave opportunistically to retain the client (DeAngelo 1981). Second, larger firms may have greater reputations to protect (Dopuch and Simunic 1980). The empirical audit literature supports this notion and Big 4 auditors generally score higher in various audit quality proxies than non-Big 4 auditors (Palmrose 1988; Becker et al. 1998; Khurana and Raman 2004; Behn et al. 2008). However, whether pairing two Big 4 auditors together would result in better audit quality than pairing one Big 4 with one non-Big 4 auditor is unclear.

From the competence perspective, if we consider Big 4 auditors as more competent, the pair of two Big 4 auditors will possess higher overall competence than the pair of one Big 4 and one non-Big 4 auditor. Moreover, Deng et al. (2012) show that the small auditor is likely to free ride on the big auditor when its level of technological competence is significantly lower. Thus, if the non-Big 4 auditor shirks, the competence level of the Big 4–non-Big 4 auditor pair will be further reduced. However, one may argue that the competence of a single Big 4 auditor is already sufficient to ensure the requisite level of audit quality and thus the difference in competence between the two types of auditor pairs may not manifest in different quality. If this is the case, whether there is a difference in audit quality will instead depend on auditor independence.

Auditor independence determines whether a discovered breach will be reported or corrected. Each auditor in the pair does its own cost-benefit analysis to determine whether or not to take corrective action. We use the following calculation based on game theory to analyze the action taken by the two auditors in the pair. We assume that if either auditor takes action, the breach will be corrected or reported. The costs of taking corrective action include damaged relationship and loss of future business with the client. In Table 1, we follow DeAngelo (1981) and represent this cost by the quasi-rents from the client, denoted R^i. We assume that this cost will be solely borne by the auditor who chooses to take corrective action, if only one auditor does so. If both auditors take action, the cost for each auditor will be lower. The costs of not taking corrective action, including the potential litigation risk and reputation loss in case the breach is discovered by regulators or other outside parties, are denoted C_{LIT} and C_{REP} respectively in Table 1.

[Insert Table 1 About Here]

For the pair of two Big 4 auditors, the risk of not taking corrective action will be equally shared by the two auditors because each has deep pockets and a strong reputation to protect, leading to the typical prisoner's dilemma setting. For the Big 4–non-Big 4 auditor pair, the

Big 4 auditor bears most, if not all, of the litigation and reputation costs. From Table 1, Panel B, we see that for the Big 4–non-Big 4 pair, the small (non-Big 4) auditor will never take corrective action because no-action is the dominant strategy (i.e., the payoffs are always better no matter what the other player does). As a result, the breach will only be reported or corrected if $C_{REP}+C_{LIT} > R^B$. For the pair of two Big 4 auditors, the breach will be reported or corrected if either of the auditors takes corrective action and $C_{REP}+C_{LIT} > \text{Min}(2*R^1, 2*R^2)$. As long as the two Big 4 auditors are equally involved and have similar economic interests in the client, $\text{Min}(2*R^1, 2*R^2)$ is greater than R^B and it is more likely that the Big 4–non-Big 4 auditor pair will take corrective action than will the pair of two Big 4 auditors. The calculation demonstrates that, due to unequally borne cost of litigation and reputation, the Big 4–non-Big 4 auditor pair may have higher independence.

To sum up, theoretical arguments suggest that the pair of two Big 4 auditors may exhibit higher auditor competence but lower auditor independence than the pair of Big 4–non-Big 4 auditors. As a result, the effect on audit quality will depend on whether auditor competence or auditor independence dominates. Empirical evidence on the effect of auditor pair on audit quality is limited and exhibits inconsistent results. Francis et al. (2009) find that the pair of two Big 4 auditors is associated with the lowest level of income-increasing abnormal accruals, whereas Marmousez (2009) reports that financial statements of firms with one Big 4 and one non-Big 4 auditor are more conservative than financial statements of firms with two Big 4 auditors. Given the uncertain theoretical prediction and contradictory empirical results, we state hypothesis 1 in null form as follows:

H1: Audit quality is not significantly different across auditor pair type.

We first proxy audit quality by using general measures of conservatism, including the growth-adjusted market-to-book ratio for unconditional conservatism and the Basu asymmetric timeliness measure for conditional conservatism. Additionally, we examine the effect of auditor pair type on a specific account, impairment. We focus on the impairment account because it is significant and more prone to manipulation by managers. The independence of external auditors is important to maintain the objectivity and fairness of impairment tests (Petersen and Plenborg 2010, 419). As a result, if auditor pairs have any effect on audit quality, this effect should be most pronounced in an account such as impairment. We first examine the timeliness of impairment loss recognition. When firms report low operating performance, it is more likely that an economic impairment needs to be booked. Hence, we test whether the probability of impairment recognition differs across auditor pair types for firms with low operating performance. Holding other things equal, a higher probability of booking an impairment under poor performance indicates higher auditor quality. We then examine the transparency of impairment-related disclosures. International accounting standards include specific requirements for impairment disclosures. However, not all French listed firms provide all the required disclosures and the level of transparency varies significantly across firms in Europe (ESMA 2013). When economic conditions (i.e., low operating performance) suggest that impairment is likely, managers intending to manipulate the impairment tests and delay impairment recognition will have incentives to provide less detailed disclosures regarding the procedures used in the impairment tests, and thus make it more difficult for outsiders to assess the appropriateness of the impairment recognition. As a result, we use the algebraic difference in impairment disclosure transparency between firms with low and high operating performance as a proxy for transparency manipulation by

management. The more negative the algebraic difference between firms with low and high operating performance, the more the firms reduce their disclosure when the likelihood of an economic impairment is high, and hence the more the transparency manipulation that is likely to have taken place. Auditors play a key role in preventing such manipulation of impairment disclosures by management. When auditors examine the impairment accounts, they can urge firms to disclose information, allowing outsiders to better assess the reasonableness of management's procedures and key assumptions. As a result, less transparency manipulation indicates higher audit quality. Moreover, given that the disclosure requirements are specified in accounting standards, it is difficult to argue that an auditor does not ask management to provide the required disclosures due to lack of competence. Thus, whether or not auditors push the firm to make the required disclosures and prevent firms from doing transparency manipulation should mainly depend on their independence level. As a result, the audit quality measure using the transparency proxy likely reflects the effect of auditor independence.

Based on this reasoning, we test the following four sub-hypotheses:

H1a: Unconditional conservatism is not significantly different across auditor pair type.

H1b: Conditional conservatism is not significantly different across auditor pair type.

H1c: The probability of booking an impairment when the operating performance is low is not significantly different across auditor pair type.

H1d: The (algebraic) difference in impairment disclosure transparency between firms with low and high operating performance is not significantly different across auditor pair type.

5. Empirical analyses

Auditor Pair Choice

We begin our analysis by estimating a model of auditor pair choice. This model serves two purposes. First, it provides information on the characteristics of firms that choose different auditor pair types. Second, because firms choose their auditor pair type, it is unclear whether observed differences in conservatism are attributable to differences in auditor pair type or to differences in the underlying characteristics of the firms that make the auditor pair choice. We use the two-stage procedure proposed by Heckman (1979) to control for this potential endogeneity. We first obtain an instrument for auditor pair choice from the auditor pair choice model and then include this instrument in the second stage models.

Prior research on single audit indicates that Big 4 accounting firms are more likely to be used by large and growing companies, complex companies, and companies with more international operations, all of which may require the international dimension, scale and expertise of a Big 4 auditor (Francis and Wilson 1988; DeFond 1992; Anderson et al. 1993; Chaney et al. 2004; Khurana and Raman 2004). Additionally, Big 4 firms are more likely to be hired by profitable companies able to pay higher audit fees, and by more leveraged companies whose creditors demand more external scrutiny (Francis et al. 2009).

However, these factors do not necessarily directly apply to joint audit. For example, a growing company does not necessarily need to be audited by two Big 4 firms. One Big 4 auditor may be sufficient and it may be more efficient for a growing firm to choose one Big 4 and one Small auditor. Therefore, expected relationships from the single audit literature may not hold for joint audit. In the context of joint audit, Francis et al. (2009) also identify a positive relation between the choice of two Big 4 auditors and ownership structure factors, such as percentage of institutional investors, cross-listing status and percentage of free float.

Based on prior literature, we estimate the following model which serves as a first stage, treatment effect model, and compute the IMR which we use in subsequent models to correct for the potential endogeneity bias of auditor pair choice:

$$\begin{aligned}\Pr(Big4_Small_t) &= f(c + b_1 Inst_t + b_2 Complex_t + b_3 \Delta Assets_t + b_4 CrossList_t \\ &+ b_5 Foreign\%_{i,t} + b_6 Float_t + b_7 Leverage_t + b_8 Risk_t + b_9 Size_t \\ &+ b_{10} Perf_t + \varepsilon)\end{aligned} \quad (1)$$

where:

- *Inst* = percentage of shares owned by institutional investors (Bloomberg).
- *Complex* = sales divided by lagged total assets (Datastream);
- Δ*Assets* = percentage change in total assets (Datastream);
- *CrossList* = 1 if the company is cross-listed in the US, and 0 otherwise (Annual Report);
- *Foreign%* = percentage of foreign sales (Datastream);
- *Float* = percentage of shares available to trade (Datastream);
- *Leverage* = financial debt minus cash and cash equivalents, divided by market value of equity (Datastream);
- *Risk* = 5-year unlevered beta (Datastream);
- *Size* = natural logarithm of market value of equity (Datastream);
- *Perf* = EBITDA divided by total assets (Datastream).

Auditor Pair and Unconditional and Conditional Conservatism

We test the relation between auditor pair type and conservatism using established measures of unconditional and conditional conservatism.

Unconditional conservatism (also known as *ex ante* or news-independent conservatism) results from (continually) understating the book value of net assets relative to their economic value. This form of conservatism, which is an accounting bias toward reporting low earnings and book value of stockholders equity, leads to higher (internally generated) goodwill and

higher market-to-book ratio. Unconditional conservatism is a primary (though not the sole) source of unrecorded goodwill, which also includes the present value of expected economic profits (from rents or growth). Empirical proxies for unconditional conservatism used in the literature are theoretically based on the Ohlson (1995) residual income model. Roychowdhury and Watts (2007) and García Lara and Mora (2004) use the market-to-book ratio to proxy for unconditional conservatism. Roychowdhury and Watts (2007) argue that the market-to-book ratio is influenced by two factors: (1) the unverifiable (unbooked) increases in value of separable assets in place (true unconditional conservatism), and (2) the expected value of economic profits (e.g., synergies between assets in place, growth, rents). We isolate the first factor by controlling for the second factor using variables such as asset intangibility, firm growth potential, current performance, risk and volatility, and investment activity. We estimate the following model adapted from Piot et al. (2011):

$$MtoB_t = b_0 + b_1 Big4_Small_t + b_2 \Delta Sales_t + b_3 Return_t + b_4 Perf_t + b_5 GW_t + b_6 PPE_t + b_7 Capex_t + b_8 IMR + \varepsilon_t \quad (2)$$

where:

- *MtoB* = market-to-book ratio of equity (Datastream);
- *Big4_Small* = 1 if one of the two external auditors is a Big 4 auditor and the other is not (Annual report), and zero if both external auditors are Big 4 auditors;
- *ΔSales* =percentage change in total sales (Datastream);
- *Return* = share return computed over the fiscal year (Datastream);
- *Perf* = EBITDA divided by total assets (Datastream);
- *GW* = goodwill divided by total assets (Datastream);
- *PPE* = property, plant and equipment divided by total assets (Datastream);
- *Capex* = capital expenditures divided by total assets (Datastream);
- *IMR* = Inverse Mills Ratio (from model (1)).

To test H1a, we examine whether firms with a Big 4–non-Big 4 auditor pair have higher market-to-book ratio which implies that book value is more understated than firms audited by a Big 4–Big 4 auditor pair. We expect sales growth, performance, capital expenditures and share return, which capture expected growth, to be positively related to market-to-book ratio. The percentage of total assets comprised of goodwill and property, plant and equipment reflects the intangibility of the business.[7]

Conditional conservatism (also known as *ex post* or news-dependent conservatism) results from writing down book values and decreasing income under sufficiently adverse circumstances, and not writing up those values when circumstances are favorable. We use the following model, adapted from Basu's (1997) piecewise linear asymmetric timeliness model, to estimate the effects of different auditor pairs:

$$X_t = b_0 + b_1 BN_t + b_2 R_t + b_3 BN * R_t + b_4 Big4_Small_t + b_5 Big4_Small * BN_t + b_6 Big4_Small * R_t + b_7 Big4_Small * BN * R_t + b_8 Size_t + b_9 Leverage_t + b_{10} Risk_t + b_{11} IMR + \varepsilon_t \quad (3)$$

where:

[7]These measures may not be good proxies if goodwill results from overpaid targets and delayed impairment.

- *R* = Share return measured from 9 months prior to fiscal year-end to 3 months after fiscal year-end (Datastream);
- *BN* = 1 if *R* is negative, and 0 otherwise;
- *X* = earnings per share divided by share price at the beginning of the fiscal year (Datastream);
- *Big4_Small* = 1 if one of the two external auditors is a Big 4 auditor and the other is not, and 0 if both external auditors are Big 4 auditors (Annual report);
- *Size* = natural logarithm of market value of equity (Datastream);
- *Leverage* = financial debt minus cash and cash equivalents, divided by market value of equity (Datastream);
- *Risk* = 5-year unlevered beta (Datastream);
- *IMR* = Inverse Mills ratio (from model (1)).

Conditionally conservative accounting results in more aggressive reporting of bad news than good news, leading to a positive coefficient, b_3. We test H1b by testing whether the coefficient b_7 is positive. A positive estimate of b_7 indicates higher conservatism for firms audited by a Big 4–non-Big 4 auditor pair than for firms audited by a pair of two Big 4 auditors. We also control for size, leverage and risk.

Auditor Pair and Recognition of Economic Impairment

Impairment tests, in particular impairment tests for goodwill, usually involve discounted cash flow models, and require managers to make several assumptions. Appendix 1 gives a summary of how impairment tests are conducted under IAS 36. The procedure is similar to provisions in FAS 142. We examine how auditor pairs affect the decision to recognize economic impairment of assets on the income statement. Given that economic impairment of an asset is not directly observable, we consider that an economic impairment is likely if a firm's operating performance (return on assets) is sufficiently low. Discounted cash flow models rely on projecting current performance over a business plan. If current performance is low, it is more likely that the present value of projected future cash flows will be below the carrying value of a given cash generating unit (see discussion of impairment testing in Appendix 1). Managers can manage the outcome of the test by choosing either overly optimistic growth assumptions or an artificially low discount rate (ESMA 2013). We reason that firms in the lowest quartile of operating performance for our sample are more likely to have economic impairment.[8] We estimate the following probit model:[9]

$$\Pr(DIMP_t) = f(c + b_1 Big4_Small_t + b_2 LowPerf_t + b_3 LowPerf * Big4_Small_t + b_4 Size_t + b_5 GW_t + b_6 MtoB_t + b_7 Perf_t + b_8 \Delta Sales_t + b_9 Risk_t + \varepsilon) \quad (4)$$

where:

- *DIMP* = 1 the firm books an impairment, and 0 otherwise (Annual report);

[8] We also estimated our model with other threshold for low performance, i.e. 5th percentile, 10th percentile, 15th percentile and 20th percentile. Results are qualitatively similar.

[9] We do not control for endogeneity in model (4) since the second stage model is also a probit model. Controlling for endogeneity does not qualitatively change the results in our other three models.

- *Big4_Small* = 1 if one of the two external auditors is a Big 4 and the other is not, and 0 if both external auditors are Big 4 auditors (Annual report);
- *LowPerf* = 1 if *Perf* is below the 25th percentile of distribution of EBITDA/Total Assets, and 0 otherwise(Datastream);
- *Size* = natural logarithm of market value of equity (Datastream);
- *GW* = goodwill divided by total assets (Datastream);
- *MtoB* = market-to-book ratio of equity (Datastream);
- *Perf* = EBITDA divided by total assets (Datastream);
- *ΔSales* =percentage change in total sales (Datastream);
- *Risk* = 5-year unlevered beta (Datastream).

To test H1c, we compare the probability of booking impairment when performance is low between firms audited by a Big 4–non-Big 4 auditor pair and firms audited by a Big 4–Big 4 auditor pair, i.e., the sum of coefficients b_1 and b_3. If $b_1 + b_3$ is positive it indicates that firms with a Big 4–non-Big 4 auditor pair are more likely to book an impairment when the probability of economic impairment is high.

We control for factors affecting *economic* impairment, i.e., operating performance, business risk, size, market-to-book ratio, and magnitude of goodwill in the balance sheet. The likelihood of economic impairments decreases with Performance (*Perf*), market-to-book ratio (*MtoB*), sales growth (*ΔSales*), and size (*Size*), and increases with goodwill (*GW*) and business risk (*Risk*). However, we do not make directional predictions on the coefficients of these control variables because prior research indicates that impairment tests may be manipulated.

Auditor Pair and Transparency of Impairment-Related Disclosures

For French listed firms, transparency of impairment test disclosures varies widely across firms. For example, the French pharmaceutical company, Stallergenes, in the "Main Accounting Methods" section of its 2006 annual report (p. 41), provides only minimal narrative information regarding impairment tests, such as "A write down is recorded once a year or more frequently if events or changes in circumstances indicate the likelihood of impairment for that acquisition goodwill", and "If an impairment is identified, the recoverable value of the CGU to which the acquisition goodwill belongs is assessed. An impairment is recognized as soon as the book value of the CGU to which the acquisition goodwill belongs exceeds the recoverable value." No further information regarding impairment tests is provided in the Notes, although the firm owns a substantial amount of intangible assets (goodwill alone represents 24% of Stallergenes' total assets) for which impairment tests are required to be performed at least once a year.

In contrast, France Telecom's 2008 annual report contains much more transparent disclosures regarding impairment-testing procedures. In Note 6 (p. 287-289), the company devotes almost three pages to its impairment tests and provides a wide range of information. It explains the level at which goodwill is tested, and provides tables with key assumptions used in the estimation of recoverable amounts (e.g., growth rate to perpetuity for each segment, main cash generating units and groups of cash generating units, post and pre-tax discount

rates used for each segment), as well as narrative explanations for specific countries where it operates.[10]

Considering these differences in transparency and the incentives to manipulate impairment tests, we search each annual report for 40 items covering the main disclosures required by IAS 36 (paragraphs 126 to 133) and other disclosures providing the main valuation assumptions used in the estimation of recoverable values. These 40 items are allocated to categories of information according to homogeneous topics. Appendix 2 lists the main categories, and the items in each category.

We assign one point per disclosed impairment item that is included in the annual report for year *t,* and compute a transparency score as follows:

$$Score_t = \frac{1}{40}\sum_{j=1}^{40} Item_{i,t} * 100 \quad (5)$$

Score is the number of disclosed impairment items for a given firm-year divided by the maximum possible number of impairment disclosures, and is expressed as a percentage. As presented in Appendix 2, the list of impairment disclosures is quite comprehensive, covering technical valuation elements of impairment tests (e.g., discount rates, neutrality of the financing structure, terminal value issues) as well as descriptive elements (e.g., whether management explains the alternative between fair value and value-in-use to estimate recoverable value, or whether valuation consultants were hired to perform impairment tests).

We estimate the following model to examine whether auditor pair composition is systematically related to the level of transparency of impairment disclosure:

$$\begin{aligned} Score_t = b_0 &+ b_1 Big4_Small_t + b_2 LowPerf_t + b_3 LowPerf * Big4_Small_t + b_4 GW_t \\ &+ b_5 Float_t + b_6 Risk_t + b_7 Size_t + b_8 Perf_t + b_9 Leverage_t \\ &+ b_{10} Coverage_t + b_{11} CrossList_t + b_{12} Change_t + b_{13} IMR + \varepsilon_t \end{aligned} \quad (6)$$

where:

- *Score* = measure of transparency of impairment disclosures, defined in (5) (Annual report);
- *Big4_Small* = 1 if one of the two external auditors is a Big 4 and the other is not, and 0 if both external auditors are Big 4 auditors (Annual report);
- *Perf* = EBITDA divided by total assets (Datastream);
- *LowPerf* = 1 if *Perf* is below the 25th percentile of distribution of EBITDA/Total Assets, and 0 otherwise (Datastream);
- *Float* = percentage of shares available to trade (Datastream);
- *GW* = goodwill divided by total assets (Datastream);
- *Risk* = 5-year unlevered beta (Datastream);
- *Size* = natural logarithm of market value of equity (Datastream);
- *Leverage* = financial debt minus cash and cash equivalents, divided by market value of equity (Datastream);

[10] These two examples have been selected on purpose from a low disclosing firm (Stallegenes, 2006) and a high disclosing firm (France Telecom, 2008), based on our Transparency Score.

- *Coverage* = natural logarithm of the number of recommendations issued by financial analysts during the year (I/B/E/S);
- *CrossList* = 1 if the company is cross-listed in the US, and 0 otherwise;
- *Change* = 1 if the firm changes an external auditor during the fiscal year, and 0 otherwise (Annual report);
- *IMR* = Inverse Mills ratio (from model (1)).

The coefficient of interest for testing H1d is b_3, which reflects the difference in the level of transparency manipulation between firms audited by a Big 4–non-Big 4 auditor pair and firms audited by a Big 4–Big 4 auditor pair. When operating performance is low, impairment is more likely. As a result, given poor operating performance, impairment becomes a bigger concern for investors. If management wants to avoid booking an appropriate amount of impairment, it may manipulate the impairment test procedures. Thus, it will have incentives to provide less transparent impairment-related disclosures in order to reduce the possibility that investors detect the manipulation. Therefore, a decrease in transparency score when the operating performance is low will indicate that management may be manipulating the disclosure to support its inappropriate impairment accounting. Auditors can play a very important role in preventing such manipulation in transparency by making sure that investors have enough information to assess the appropriateness of management's estimation and assumption. Thus, if audit quality does not differ between Big 4–Big 4 auditor pairs and Big 4–non-Big 4 auditor pairs, we expect the coefficient on *LowPerf*Big4_Small* to be zero. A positive coefficient on *LowPerf*Big4_Small* would suggest lower transparency manipulation and hence better audit quality for the Big 4–non-Big 4 auditor pair and vice versa.

We include several control variables in model (6), including the percentage of total assets comprised of goodwill. We expect the level of goodwill to be positively associated with the transparency of impairment-testing disclosures. We also control for other factors affecting general disclosures, such as firm size, cross-listed status, business risk, free float, performance, leverage, and analyst coverage. Large, risky, high performing, cross-listed firms with large share floats and high financial leverage generally have incentives to disclose more. However, we do not know if, and how, these incentives affect specific impairment-testing disclosures. Therefore, we do not make directional predictions for the coefficients of these control variables. We predict that change in auditor could reduce impairment-testing disclosures. Analyst coverage captures an alternative channel of communication. Everything else equal, a firm followed by more analysts may disclose less information in its annual report as analysts can substitute the annual report (Botosan 1997, 326). However, prior studies also show that firms with higher disclosure quality tend to have higher analyst coverage ((Healy et al. 1999). Therefore, we do not make a directional prediction for the effect of analyst coverage on impairment-related disclosures.

Sample and Empirical Results

Our sample includes firms from the 120 listed firms comprising the SBF 120 index, and spans the period 2006 – 2009. These firms represent large firms (included in the French CAC 40 index) and mid cap firms (the next 80 firms). We delete 10 financial firms because they are required to follow industry-specific impairment rules and disclosures, and two firms audited by a non-Big 4 auditor pair. Due to missing variables for some firms, our final sample

comprises 91 firms representing 317 firm-year observations. Our sample is relatively uniformly distributed across 10 industries (see Table 2, Panel A), with chemicals (healthcare) having the highest (lowest) level of representation. We winsorize each continuous variable at its first and ninety-ninth percentiles.

[Insert Table 2 About Here]

Table 2, Panel B provides unconditional comparisons between firms audited by a Big 4–Big 4 pair and a Big 4–non-Big 4 pair. First, from a market share perspective, approximately 45% of the firms are audited by a Big 4–Big 4 auditor pair over the period, and the remaining 55% by a Big 4–non-Big 4 auditor pair. These statistics illustrate that the French audit market is one of the least concentrated in Europe as more than 50 percent of the large firms are audited by at least one non-Big 4 auditor whereas the Big 4 market share of listed firms in other G8 countries is typically above 90%.[11]

Second, impairments occur on average 43% of the time during our sample period. While firms audited by a Big 4–Big 4 auditor pair booked impairments 52% of the time, firms audited by a Big 4–non-Big 4 pair impaired assets 35% of the time (difference significant at 1%). From a transparency perspective, the mean (median) impairment-test transparency score for the four-year period is 54 points (54 points). Firms audited by a Big 4–Big 4 pair exhibit a higher transparency score compared to firms audited by a Big 4–non-Big 4 pair. We note, however, that such a univariate comparison of the frequency of impairment or transparency score is not dependent on the existence of economic conditions indicating an impairment.

Third, we observe that the market-to-book ratio is significantly higher for firms audited by a Big 4–non-Big 4 pair (significant at less than 5%), consistent with firms audited by a Big 4–non-Big 4 pair reporting more conservatively than firms audited by a Big 4–Big 4 pair. Conversely, the lower market-to-book ratio of firms audited by a Big 4–Big 4 pair indicates potentially overstated asset book values for these firms.

Fourth, Table 2, Panel B, shows that the mean (median) risk of firms in the sample, as proxied by 5-year unlevered beta, is 0.98 (0.74), the mean (median) return is 8.4% (-0.0%), the mean (median) percentage of firms' shareholder's equity that is available to trade (free float) is 67% (68%), the mean (median) impairment of assets represents on average 2.2% (0.0%) of total intangible assets over the time period,[12] the mean (median) operating performance measured by return on assets (EBITDA divided by total assets) is 12.4% (10.8%), and the mean (median) market-to-book ratio is 2.3 (2.0). We also observe that changes of either one or both auditors during a year do not occur frequently, i.e., only 3% of the time. Goodwill represents on average 29% (27%) of firms' total assets. Firms audited by two Big 4 auditors tend to be larger, have more institutional ownership, are more likely to be cross-listed, have more business risk, are more closely followed by analysts, are less leveraged, exhibit slightly less sales and assets growth, and spend less on capital expenditures.

In Table 2, Panel C we condition our analyses of the frequency and transparency of impairments on the existence of economic conditions suggesting the need for an impairment

[11] http://www.gti.org/Press-room/Press-archive/2007/G8-audit-concentration.asp

[12] On the sub-sample of 136 firm-year observations booking impairment, the mean (median) impairment is 5.1% (1%) of total intangible assets, ranging from 0.1% of total intangible assets to 55% of total intangible assets.

test. An impairment test is deemed necessary when there is evidence of an economic impairment, i.e., when market-to-book ratio is below one. Under these conditions, while firms audited by a Big 4–Big 4 auditor pair booked impairment only 45% of the time, firms audited by a Big 4–non-Big 4 auditor pair booked impairment 67% of the time. This simple observation indicates that *a priori* firms audited by a Big 4–non-Big 4 auditor pair exhibit higher levels of conditional conservatism, i.e., conditional on the existence of poor economic conditions, they are more likely to recognize bad news through more frequent impairments. From Table 2, Panel C we also observe that firms audited by a Big 4–non-Big 4 pair provide more transparent impairment disclosures once it is evident that an impairment is necessary. Panel D presents disclosure levels conditional on poor operating performance. It suggests that firms audited by Big 4–non-Big 4 auditor pairs become more transparent when operating performance is low while firms audited by Big 4–Big 4 auditor pairs do not exhibit such a pattern. Combining the results from Panels B, C, and D of Table 2, we conclude that although on average firms audited by a Big 4–Big 4 auditor pair book impairments more frequently and score higher in impairment-related disclosures, they tend to recognize impairments less frequently and provide less transparent impairment-related disclosures when economic conditions suggest that an impairment needs to be booked. This evidence suggests that firms audited by a Big 4–Big 4 auditor pair seem to be booking untimely impairments and reducing their impairment-related disclosures accordingly to support the manipulation in impairment test procedures.

In Panel E of Table 2, we perform an analysis of differences in transparency over time. The results indicate an increase over time in the level of transparency score of impairment disclosures with the mean (median) score rising from 50 pts (51 pts) in 2006 to 59 pts (58 pts) in 2009. The dispersion of transparency also tends to increase over the period (from 14 pts in 2006 to 16 pts in 2009).

We conclude our descriptive analyses with the correlation matrix in Table 2, Panel F. *DIMP* is significantly positively correlated with *Score*, *Size*, *CrossList* and *Coverage*; and negatively correlated with *Big4_Small, Score, ΔAssets, Capex* and *MtoB*. We can see that *Score* is positively correlated with *CrossList, Size*, *Float, GW, Leverage* and *Coverage.* The correlation between *Score* and *Big4_Small* is negative and statistically different from zero confirming that firms audited by Big 4–Big 4 pairs are on average unconditionally more transparent in their impairment test disclosures. The level of transparency is negatively correlated with *Perf*, *MtoB*, *ΔAssets*¸ *Change* and *Capex*.

Choice of Auditor Pair Type

Table 3 presents the estimation results of the probit model in (1) that identifies factors related to the choice of auditor pair type.

[Insert Table 3 About Here]

The results indicate that larger firms, firms with more complex operations, firms with higher institutional holdings, firms with more business risk, better performing firms, firms with higher levels of financial leverage, and firms cross-listed in the US tend to choose a Big 4–Big 4 auditor pair over a Big 4–non-Big 4 auditor pair. Prior research indicates that these factors are associated with more conservative financial reporting (e.g., Ahmed et al. 2002; Ramalingegowda and Yu 2012). Therefore, everything else equal, any selection bias introduced by a firm's joint auditor pair choice positively influences the probability of finding

higher conservatism for firms audited by two Big 4 auditors, i.e., the selection will only bias against our prediction. Overall, the pseudo-R^2 is 41% and is relatively high compared to previous studies (see Francis et al. 2009, Table 3).

Auditor Pair Type and Conservatism

H1 examines the association between auditor pair type and audit quality. While a Big 4–Big 4 auditor pair is likely to exhibit a higher level of competence, a Big 4–non-Big 4 pair may offset the potentially lower level of competence with a higher level of independence. The overall impact of auditor pair composition on audit quality depends on the relative differences in terms of competence and independence. We use the degree of conservatism in financial reporting by the client of the auditor pair as the proxy for audit quality, and examine both unconditional and conditional conservatism. We use model (2) to test H1a, which asserts that the degree of unconditional conservatism is not a function of auditor pair type, and report the estimation results in Table 4.

[Insert Table 4 About Here]

The coefficient on Big 4–non-Big 4 auditor pair is positive and significant at the 5% level indicating a higher audit quality measured by unconditional conservatism for these auditor pairs compared to Big 4–Big 4 pairs.

H1b evaluates audit quality differences measured in terms of conditional conservatism across the two types of auditor pairs. We test H1b using model (3) which is based on Basu (1997), and report the estimation results in Table 5.

[Insert Table 5 About Here]

The differential effect on the degree of conditional conservatism, (i.e., the asymmetrically timely recognition of bad news versus good news) of Big 4–non-Big 4 auditor pair type over Big 4–Big 4 auditor pair type is captured by b_7, which is significantly positive (at 5%; one-tailed test). It indicates that firms audited by a Big 4–non-Big 4 auditor pair report economic losses "more aggressively" than economic gains. Marmousez (2009) reports qualitatively similar but statistically stronger results for an earlier time period (2003). Our comparatively lower statistical significance may be due to the time period of the study, i.e., 2006-2009. One reason for the lower association between earnings and returns is that our sample period includes the financial crisis of 2008, when firms' returns were affected more by macroeconomic factors than by microeconomic, firm-specific factors.

Using general measures of conservatism, tests for H1a and H1b indicate better audit quality for the Big 4–non-Big 4 auditor pair compared with the Big 4–Big 4 auditor pair. In order to provide more refined tests of the effect of auditor pair type on audit quality, we analyze a specific account, impairment.

Auditor Pair Type and Recognition of Economic Impairments

The purpose of these tests is to examine whether the differential audit quality across auditor pair types documented using measures of unconditional and conditional conservatism are also found at the level of more precise accounting procedures such as impairment testing. In this regard, H1c examines differences across auditor pair types in timeliness of loss recognition through impairments. To test H1c, we estimate model (4) which assesses the probability of a firm reporting an impairment when economic conditions indicate that the

probability of impairment is high. We measure the degree of deterioration in the firm's economic condition using its performance. Performance in the lower quartile of the distribution indicates a higher probability that some assets are impaired. The coefficient of interest in model (4) is b_1+b_3, which reflects the incremental likelihood of impairment for firms with lower economic performance that are audited by a Big 4–non-Big 4 auditor pair over firms audited by a Big 4–Big 4 auditor pair. We report the estimation results of the probit model (4) in Table 6.

[Insert Table 6 About Here]

The coefficient b_3 on *LowPerf*Big4_Small* is positive and significant (coefficient = 0.41; significant at 1%). Additionally, the sum of coefficients b_1 and b_3 is significantly positive (at 5%; one-tailed test, see note below Table 6), indicating that when operating performance is low, firms audited by a Big 4–non-Big 4 auditor pair are more likely to book impairments than firms audited by a Big 4–Big 4 auditor pair. This result is consistent with the earlier finding that Big 4–non-Big 4 auditor pairs exhibit higher audit quality than Big 4–Big 4 auditor pairs. An examination of the coefficients on the control variables reveals some interesting findings. While size positively affects the likelihood of booking an impairment (significant at less than 1% two-sided), risk and market-to-book ratio reduce the probability of booking an impairment (significant at 5% two-sided). Given that, other things equal, riskier firms are more likely to record impairments, our finding of a negative relation between risk and the probability of recording an impairment suggests that firms may be manipulating impairment testing procedures in an attempt to delay the recognition of losses (e.g., Hayn and Hughes 2006; Ramanna 2008; Li and Sloan 2011; Ramanna and Watts 2012).

Taken together, our tests of H1a, H1b and H1c indicate that, on average, firms audited by Big 4–non-Big 4 auditor pairs exhibit higher levels of audit quality than firms audited by Big 4–Big 4 auditor pairs. The theoretical discussion in Section IV attributes the difference in audit quality to differences in competence and/or independence across auditor pairs. Given that Big 4–Big 4 auditor pairs have higher auditor competence than Big 4–non-Big 4 auditor pairs, the finding of lower audit quality for firms audited by Big 4–Big 4 auditor pairs suggests that they must possess lower auditor independence. Thus, our results for H1a, H1b and H1c indicate that auditor independence is lower for Big 4–Big 4 auditor pairs and auditor independence dominates auditor competence in the effect of auditor pair type on audit quality.

Auditor Pair and Transparency of Impairment-Related Disclosures

Having documented differences in audit quality across auditor pairs using both aggregate and specific measures of conservatism, we next attempt to identify the source of such differences. If we view audit quality as a function of auditor competence and auditor independence, the higher audit quality for the pair of Big 4 and non-Big 4 auditors must come from higher auditor independence, as auditor competence for the Big 4–Big 4 pair is unlikely to be lower than that for the Big 4–non-Big 4 pair. Auditor independence or auditor competence are difficult to directly measure because it is hard to differentiate whether the auditor fails to report a breach because they cannot discover it or because they discover it but choose not to report it. Thus, it is difficult to test the auditor independence explanation directly. We attempt to strengthen our argument for auditor independence by testing audit

quality in a setting where auditor independence is likely to play a more important role than auditor competence. We test H1d by using the transparency of impairment-related disclosures. Since knowing the required impairment-related disclosures listed in the accounting standards forms the basic or minimal level of auditor competence, whether the auditor will allow or disallow the management to provide less transparent disclosures when the operating performance is poor is mainly affected by auditor independence. As a result, if we find any difference in audit quality using the transparency proxy, the difference should be largely driven by auditor independence.

[Insert Table 7 About Here]

We find that firms audited by Big 4–Big 4 auditors reduce their disclosure transparency when they have poor operating performance (the coefficient on *LowPerf* is negative and significant at less than 10%, two-sided) whereas firms audited by Big 4–non-Big 4 pairs increase their disclosure transparency when operating performance is low (the coefficient on *LowPerf* + *LowPerf*Big 4_Small* is positive). This indicates that firms audited by Big 4–Big 4 pairs are manipulating impairment disclosures while firms audited by Big 4–non-Big 4 pairs are not. The difference in disclosure manipulation between the two groups is captured by the coefficient on *LowPerf*Big4_Small* which is positive and significant at less than 5%, two-sided. This indicates that the Big 4–non-Big 4 auditor pair allows less disclosure manipulation by management and thus is more independent compared to the Big 4-Big 4 auditor pair. These results suggest higher audit quality, and most likely higher auditor independence, for the Big 4–non-Big 4 auditor pair. This is consistent with our game theory model predictions, i.e., Big 4 auditors, which bear a disproportionately larger fraction of reputation and litigation costs when paired with non-Big 4 auditors, face stronger incentives to force firms to report more transparent disclosures when the operating performance is poor.[13]

The results in Table 7 also show that the transparency of impairment-related disclosures increases with goodwill in the balance sheet (significant at less than 5%, two-sided), with *Leverage* (significant at less than 10%, two-sided), and with *Float* (significant at less than 5%, two-sided). The transparency decreases with *Size* (significant at less than 10%, two-sided) and *Perf* (significant at less than 5%, two-sided). Overall, the model explains 22% of the variation of the transparency score.

6. Conclusion

In the current international debate on legal audit reform, France's unique institutional environment offers an ideal setting for assessing the benefits and potential limits of joint audit. We show that the two dimensions of audit quality, namely competence and independence, are likely to differ across different auditor pairs. We provide theoretical and empirical evidence on the implication of joint auditor pairs for accounting conservatism using

[13]Additional analysis also shows that when impairment is booked, firms audited by Big 4–non-Big 4 pairs are associated with larger increase in transparency compared with firms that are audited by Big 4–Big 4 pairs. Results are available from the authors upon request.

established measures of conservatism as well as impairment test timeliness and transparency.[14]

We demonstrate that the pairing of two Big 4 auditors, who share similar incentives, may lead to the prisoner's dilemma solution and harm auditor independence, which can result in a lower level of conservatism. This situation is less likely to occur when a Big 4 auditor is paired with a non-Big 4 auditor because the Big 4 auditor bears a disproportionately larger percentage of the reputation and litigation costs. We examine the relation between auditor pair type and measures of unconditional and conditional conservatism using market-to-book ratio and Basu's (1997) asymmetric timeliness coefficient, respectively, and complement these analyses with tests of impairment timeliness and transparency.

Using a sample of French listed firms, we present evidence that firms audited by Big 4–non-Big 4 auditor pairs are more unconditionally and conditionally conservative and more likely to recognize economic impairment than firms audited by Big 4–Big 4 auditor pairs. We further show that unlike firms audited by Big 4–Big 4 pairs, firms audited by Big 4–non-Big 4 pairs become more transparent in their impairment disclosure when their operating performance is poor. Overall, these results are consistent with our theoretical predictions.

We contribute to the literature at several levels. First, we provide insights on the implication of joint audit for audit quality that are relevant to policy makers. Our study indicates that policy makers considering joint audit in order to decrease the market concentration and improve audit quality should consider the composition of auditor pairs. A pair of two Big 4 auditors will not necessarily result in better audit quality than a pair of one Big 4 auditor and one non-Big 4 auditor. In fact, our results indicate that the Big 4–non-Big 4 auditor pair could result in higher audit quality due to higher auditor independence. Second, using game theory models and self-constructed measures of impairment disclosure transparency, we attempt to disentangle the effects of competence and independence on audit quality. Lastly, we show that strategic interactions between the joint auditors are important in determining their action and hence the audit quality. Specifically, unequal risk sharing between Big and Small auditors can affect auditors' independence and is likely to have an effect on audit quality.

[14] We have also examined the relation between auditor pairs and abnormal accruals and find no statistical differences between firms audited by Big 4–Big 4 pairs vs. Big 4–non-Big 4 pairs and absolute or signed abnormal accruals.

Appendix 1 – Impairment Tests: Background

IAS 36, "Impairment of assets" (IASB 2004), prescribes the procedures and disclosures required to perform impairment tests. IAS 36 covers a large range of assets from tangible to intangible assets: land, buildings, machinery, investment property, investments in subsidiaries carried at cost, technologies, brands, customer relationships, and goodwill. Impairments are required to be reported in profit or loss if the net book value of an asset is higher than the recoverable value, the latter being the higher of fair value less costs to sell or value-in-use. If it is impossible to determine the recoverable amount for an individual asset, IAS 36 prescribes that recoverable amount be determined for groups of assets known as cash generating units. In order to identify a specific cash generating unit, the associated cash flows must be independent from cash flows arising from other cash generating units. Goodwill is typically allocated to one or several cash generating units and tested indirectly within a cash generating unit or group of cash generating units. The fair value estimate of the cash generating unit is typically based either on a discounted cash flow approach or on a relative valuation approach except when a cash generating unit is listed (which is extremely rare). If the recoverable value of a cash generating unit to which goodwill has been allocated is below its carrying value, the entity must recognize an impairment loss. The value of goodwill is written down first before reducing other assets' carrying values.

Because of the valuation methods used, impairments of assets are based on management estimates (Petersen and Plenborg 2010, 420). Managers usually acknowledge that they use specific assumptions for impairment testing purposes. For example in Alcatel-Lucent's 2008 annual report (p. 245) its management acknowledges that "the recoverable values of our goodwill and intangible assets, as determined for the impairment tests performed by the Group, are based on key assumptions which could have a significant impact on the consolidated financial statements. These key assumptions include, among other things, the following elements: discount rate; and projected cash-flows […]." Managers are often not explicit regarding the valuation assumptions they used to estimate recoverable values.

Appendix 2 - List of the Items of the Score Measuring the Transparency of Impairment Tests

# items	Categories	Items
1	Presentation and general explanations of IAS 36	Does the report explicitly mention IAS 36?
2		Does the report explain the alternative between value-in-use and fair value less costs to sell?
3	Details on valuation methods: fair value or value-in-use	Does the report mention "costs to sell" to estimate fair value?
4		Does the report mention the use of a DCF model to determine value-in-use?
5		Does the report mention the use of a DCF model to determine fair value (as a level 3 estimate)?
6		Does the report mention another approach to determine fair value?
7	Complexity of methods used	Does the report mention using different methods for valuation of different CGUs?
8		Does the report mention different valuation methods for the same CGU?
9	Number of cash-generating units	Does the report include the number of CGUs
10	Details on the cost of capital	Does the report mention the alternative between WACC and other approach?
11		Does the report mention the use of another model to estimate cost of capital?
12		Does the report mention the tax effect on discount rate?
13		Does the report give details on the computation of the discount rate?
14	Number of discount rates	Does the firm adjust the firm's rate for specific CGUs?
15		Does the report explain the use of different discount rates per CGU?
16		Does the report explain the adjustments/different discount rates used?
17	Financing neutrality and discount rate	Does the report mention the neutrality of the financing structure on the discount rate?
18	Origin of the discount rate	Does the report mention using valuation consultants to conduct impairment tests?
19		Does the report mention using consultants to estimate discount rates?
20		Does the report mention that discount rates are based on analysts' estimates?
21		Does the report mention that discount rates are based on estimates of analysts following the sector?
22	Discount rate components	Does the report disclose the base rate of the discount rate?
23		Does the report disclose the risk free rate chosen?
24		Does the report mention the beta coefficient chosen?
25		Does the report mention the risk premium chosen?
26		Does the report mention management's target leverage ratio?
27		Does the report mention the specific beta of the company?
28		Does the report mention the beta of peer firms?
29	Impairment test sensitivity	Does the report mention sensitivity tests performed on the discount rate?
30		Does the report mention sensitivity tests performed on projected cash flows or other parameters?

31	Explanation of the variations of the discount rate	Does the report explain the variations of discount rates from year to year?
32	Cash flows	Does the report explain if projected cash flows are CGU-specific or from management BP?
33	Discount rate & cash flows adequacy	Does the report mention that cash flows and discount rates are adequate (e.g., both pre-tax)?
34	Extrapolation	Does the report mention the extrapolation period between the end of the BP and terminal value?
35		Does the report mention what is the maximum number of periods for BPs?
36		Does the report mention what is the extrapolation period after the BP (if applicable)?
37	Terminal value	Does the report mention if terminal value is computed with a multiple?
38		Does the report mention if terminal value is computed with an infinite projection period?
39		Does the report mention the level of multiple applied (if applicable)?
40		Does the report mention the terminal growth assumption (if applicable)?

Notes. DCF: Discounted Cash Flows, CGU: Cash Generating Unit, WACC: Weighted Average Cost of Capital, BP: Business Plan.

References

Ahmed, A. S., B. K. Billings, R. M. Morton, and M. Stanford-Harris. 2002. The role of accounting conservatism in mitigating bondholder-shareholder conflicts over dividend policy and in reducing debt costs. *The Accounting Review* 77 (4): 867-890.

Anderson, D., D. Stokes, and I. Zimmer. 1993. Corporate takeovers and auditor switching. *Auditing* 12 (1): 65-73.

André, P., G. Broye, C. Pong, and A. Schatt. 2013. Are joint audits associated with higher audit fees? *Working paper ESSEC Business School*.

Antle, R., and B. Nalebuff. 1991. Conservatism and auditor-client negotiations. *Journal of Accounting Research* 29 (3): 31-54.

Basu, S. 1997. The conservatism principle and the asymmetric timeliness of earnings. *Journal of Accounting & Economics* 24 (1): 3-37.

Becker, C. L., M. L. Defond, J. Jiambalvo, and K. R. Subramanyam. 1998. The effect of audit quality on earnings management. *Contemporary Accounting Research* 15 (1): 1-24.

Behn, B. K., C. Jong-Hag, and T. Kang. 2008. Audit quality and properties of analyst earnings forecasts. *Accounting Review* 83 (2): 327-349.

Botosan, C. A. 1997. Disclosure level and the cost of equity capital. *The Accounting Review* 72 (3): 323-349.

Carcello, J. V., and A. L. Nagy. 2004. Audit firm tenure and fraudulent financial reporting. *Auditing* 23 (2): 57-71.

Chaney, P. K., D. Jeter, and L. Shivakumar. 2004. Self-selection of auditors and audit pricing in private firms. *The Accounting Review* 79 (1): 51-72.

Cook, J., D. Hatherly, L. Nadeau, and L. C. Thomas. 1997. Does cooperation in auditing matter? A comparison of a non-cooperative and a cooperative game model of auditing. *European Journal of Operational Research* 103 (3): 470-482.

DeAngelo, L. E. 1981. Auditor size and audit quality. *Journal of Accounting & Economics* 3 (3): 183-199.

DeFond, M. L. 1992. The association between changes in client firm agency costs and auditor switching. *Auditing* 11 (1): 16-31.

Demski, J. S., and R. J. Swieringa. 1974. A cooperative formulation of the audit choice problem. *The Accounting Review* 49 (3): 506-513.

Deng, M., L. Tong, D. A. Simunic, and M. Ye. 2012. Do joint audits improve or impair audit quality? *Working paper* University of Houston.

Dopuch, N., and D. A. Simunic. 1980. The nature of competition in the auditing profession: A descriptive and normative view. In *Regulation and the accounting profession*, Eds, Buckley, J. and Weston, F.Belmont, California.

ESMA. 2013. European enforcers review of impairment of goodwill and other intangible assets in the IFRS financial statements. *European Securities and Market Authority* ESMA Report (January).

European_Commission. 2011a. *Proposal for a directive of the European parliament and of the council: Amending directive 2006/43/ec on statutory audits of annual accounts and consolidated accounts.* Brussels.

European_Commission. 2011b. *Proposal for a regulation of the European parliament and of the council: On specific requirements regarding statutory audit of public-interest entities.* Brussels.

FASB. 2001. *Statement of financial accounting standards (SFAS) No. 142: Goodwill and other intangible assets.* Norwalk, CT: Financial Accounting Standards Board.

Fellingham, J. C., and D. P. Newman. 1985. Strategic considerations in auditing. *The Accounting Review* 60 (4): 634.

Fields, T. D., T. Z. Lys, and L. Vincent. 2001. Empirical research on accounting choice. *Journal of Accounting & Economics* 31 (1-3): 255-307.

Francis, J., J. D. Hanna, and L. Vincent. 1996. Causes and effects of discretionary asset write-offs. *Journal of Accounting Research* 34 (3): 117-134.

Francis, J. R., C. Richard, and A. Vanstraelen. 2009. Assessing france's joint audit requirement: Are two heads better than one? *Auditing* 28 (2): 35-63.

Francis, J. R., and E. R. Wilson. 1988. Auditor changes: A joint test of theory relating to agency costs and auditor differentiation. *The Accounting Review* 63 (4): 663.

García Lara, J. M., and A. Mora. 2004. Balance sheet versus earnings conservatism in Europe. *European Accounting Review* 13 (2): 261-292.

Hatherly, D., L. Nadeau, and L. Thomas. 1996. Game theory and the auditor's penalty regime. *Journal of Business Finance & Accounting* 23 (1): 29-45.

Hayn, C., and P. J. Hughes. 2006. Leading indicators of goodwill impairment. *Journal of Accounting, Auditing & Finance* 21 (3): 223-265.

Healy, P. M., A. P. Hutton, and K. G. Palepu. 1999. Stock performance and intermediation changes surrounding sustained increases in disclosure. *Contemporary Accounting Research* 16 (3): 485-520.

Heckman, J. J. 1979. Sample selection bias as a specification error. *Econometrica* 47 (1): 153-161.

IASB. 2004. *International accounting standard (IAS) No. 36: Impairment of assets.* London: IASC Foundation Publications Department.

Khurana, I. K., and K. K. Raman. 2004. Litigation risk and the financial reporting credibility of big 4 versus non-big 4 audits: Evidence from anglo-american countries. *The Accounting Review* 79 (2): 473-495.

Lesage, C., N. Ratzinger-Sakel, and J. Kettunen. 2011. Is joint audit bad or good? Efficiency perspective evidence from three European countries. *Working paper - HEC Paris, Ulm University and University of Jyvaskyla*.

Li, K. K., and R. G. Sloan. 2011. Has goodwill accounting gone bad? *Canadian Academic Accounting Association, Annual Conference, Toronto*.

Marmousez, S. 2009. *The choice of joint-auditors and earnings quality: Evidence from French listed companies.* Canadian Academic Accounting Association, Annual Conference, Montreal.

Matsumura, E. M., and R. R. Tucker. 1992. Fraud detection: A theoretical foundation. *The Accounting Review* 67 (4): 753-782.

Mazars. 2010. Contribution to the consultation on the green paper "audit policy: Lessons from the crisis". *available at http://www.mazars.fr/mazarspage/download/54034/1299441/version/2/file/GreenPaper_EN.pdf.*

Neveling, N. 2007. French CFO attacks joint audit. *Accountancy Age*: 4-4.

Ohlson, J. A. 1995. Earnings, book values, and dividends in equity valuation. *Contemporary Accounting Research* 11 (2): 661-687.

Palmrose, Z.-V. 1988. An analysis of auditor litigation and audit service quality. *The Accounting Review* 63 (1): 55-74.

Petersen, C., and T. Plenborg. 2010. How do firms implement impairment tests of goodwill? *Abacus* 46 (4): 419-446.

Piot, C., P. Dumontier, and R. Janin. 2011. IFRS consequences on accounting conservatism within Europe: The role of big 4 auditors. *Working paper* Université de Grenoble.

Ramalingegowda, S., and Y. Yu. 2012. Institutional ownership and conservatism. *Journal of Accounting & Economics* 53 (1/2): 98-114.

Ramanna, K. 2008. The implications of unverifiable fair-value accounting: Evidence from the political economy of goodwill accounting. *Journal of Accounting & Economics* 45 (2/3): 253-281.

Ramanna, K., and R. Watts. 2012. Evidence on the use of unverifiable estimates in required goodwill impairment. *Review of Accounting Studies* 17 (4): 749-780.

Roychowdhury, S., and R. L. Watts. 2007. Asymmetric timeliness of earnings, market-to-book and conservatism in financial reporting. *Journal of Accounting & Economics* 44 (1/2): 2-31.

Sikka, P. 2009. Financial crisis and the silence of the auditors. *Accounting, Organizations & Society* 34 (6/7): 868-873.

Thinggaard, F., and L. Kiertzner. 2008. Determinants of audit fees: Evidence from a small capital market with a joint audit requirement. *International Journal of Auditing* 12 (2): 141-158.

Watts, R. L., and Zimmerman. 1986. *Positive accounting theory.* NJ: Edgewood Cliff.

Zerni, M., E. Haapamäki, T. Järvinen, and L. Niemi. 2012. Do joint audits improve audit quality? Evidence from voluntary joint audits. *European Accounting Review* Forthcoming.

Table 1 – Joint-Audit Game

Panel A – Pair of Two Big 4 Auditors

		Big 4 Auditor #1	
		Corrective actions	***No-action***
Big 4 Auditor #2	***Corrective actions***	$(-p*R^1 ; -q*R^2)$	$(0 ; -R^2)$
	No-action	$(-R^1; 0)$	$(-1/2*[C_{REP}+C_{LIT}] ; -1/2*[C_{REP}+C_{LIT}])$

R represents the total potential quasi-rent from the client. Taking corrective actions may lead to the loss of the quasi-rents. R^1 and R^2 represent the loss in quasi-rents for the Big 4 auditor #1 and auditor #2, respectively, when only one auditor takes the corrective action. $R^1 + R^2 = R$. p and q range between 0 and 1, which makes either auditor lose less quasi-rents when both auditors take actions. C_{REP} is the reputation cost for auditors, C_{LIT} is the litigation cost for auditors.

Panel B –Pair of a Big 4 Auditor and a non-Big 4 Auditor

		Big 4 auditor	
		Corrective actions	***No-action***
Non-Big 4 auditor	***Corrective actions***	$(-m*R^B ; -n*R^S)$	$(0 ; -R^S)$
	No-action	$(-R^B; 0)$	$(-[C_{REP}+C_{LIT}] ; 0)$

R^B and R^S represent the loss in quasi-rents for the Big 4 auditor and non-Big 4 auditor respectively when only one auditor takes corrective action. $R^B + R^S = R$. m and n range between 0 and 1, which makes either auditor lose less quasi-rents when both auditors take actions. C_{REP} is the reputation cost for auditors, C_{LIT} is the litigation cost for auditors.

Table 2 – Descriptive Statistics of the SamplePanel A – Overview of the Sectors Composing the Sample

	%	N
Restaurants and Hotels	8.8%	8
Services and Transport	8.8%	8
Chemicals	13.2%	12
Technologies	11.0%	10
Car Manufacturers	11.0%	10
Software and Professional Services	9.9%	9
Energy	8.8%	8
Food Products	11.0%	10
Healthcare	5.5%	5
Telecom and Media	12.1%	11
Total Firms	100%	91

Firms are grouped according to Bloomberg sectors.

Panel B – Summary Statistics of the Main Variables

	Total Sample N = 317			Big4_Big4 = 1 n = 144			Big4_Small = 1 n = 173			BB - BS	
	Mean	Median	St. Dev	Mean	Median	St.Dev	Mean	Median	St. Dev	Mean Diff	
DIMP	0.429	0.000	0.496	0.521	1.000	0.501	0.353	0.000	0.479	0.168	***
Score	53.836	54.200	16.195	56.577	57.100	16.507	51.554	53.300	15.614	5.023	***
Perf	0.124	0.108	0.080	0.129	0.112	0.093	0.119	0.106	0.068	0.010	
MtoB	2.349	2.010	1.567	2.153	1.960	1.426	2.511	2.050	1.663	-0.358	**
Imp%	0.022	0.000	0.080	0.025	0.001	0.084	0.019	0.000	0.077	0.005	
Inst	0.320	0.266	0.209	0.354	0.382	0.217	0.291	0.262	0.199	0.063	***
Complex	0.822	0.797	0.378	0.845	0.777	0.373	0.804	0.811	0.382	0.041	
ΔAssets	0.100	0.036	0.279	0.066	0.026	0.229	0.127	0.044	0.313	-0.061	**
CrossList	0.187	0.000	0.390	0.287	0.000	0.454	0.104	0.000	0.306	0.183	***
Foreign%	0.560	0.588	0.243	0.581	0.633	0.247	0.542	0.551	0.238	0.038	
ΔSales	0.035	0.029	0.134	0.023	0.025	0.125	0.045	0.035	0.140	-0.022	*
Float	0.675	0.688	0.242	0.677	0.734	0.262	0.673	0.664	0.226	0.003	
GW	0.285	0.268	0.180	0.282	0.255	0.183	0.287	0.288	0.177	-0.005	
PPE	0.471	0.374	0.340	0.496	0.428	0.351	0.451	0.351	0.330	0.045	
Risk	0.984	0.737	0.913	1.261	0.791	1.222	0.753	0.683	0.416	0.508	***
Size	8.476	8.477	1.377	9.151	9.124	1.242	7.918	7.870	1.227	1.234	***
Leverage	0.355	0.239	0.781	0.258	0.167	0.828	0.435	0.283	0.731	-0.177	**
Change	0.032	0.000	0.175	0.028	0.000	0.165	0.035	0.000	0.184	-0.007	
Coverage	5.320	5.371	0.417	5.448	5.495	0.405	5.213	5.263	0.396	0.236	***
Capex	0.289	0.041	2.099	0.043	0.041	0.025	0.066	0.042	0.071	-0.024	***
R	0.084	-0.006	0.498	0.118	-0.011	0.564	0.056	0.015	0.435	0.062	
X	0.064	0.054	0.063	0.069	0.054	0.069	0.061	0.054	0.057	0.008	

*p<.1 (two-sided tests); **p<.05(two-sided tests); ***p<.01 (two-sided tests)

Big4_Big4 = 1 if the firm's external auditors are both Big 4 auditors (Annual report). *Big4_Small* = 1 if one of the two external auditors is a Big 4 auditor and the other is not, and 0 if both external auditors are Big 4 auditors (Annual report). *DIMP* = 1 if the firm books an impairment, and 0 otherwise (Annual report). *Score* = self-constructed measure of transparency of impairment tests (Annual report). *Perf* = EBITDA divided by total assets (Datastream). *MtoB* = market-to-book ratio of equity (Datastream). *Imp%*= impairment charge, if any, divided by total intangible assets (Annual report and Datastream). *Inst* = percentage of shares owned by institutional investors (Bloomberg). *Complex* = sales divided by lagged total assets (Datastream). *ΔAssets* = percentage change in total assets (Datastream). *CrossList* = 1 if the company is listed in the US, and 0 otherwise. *Foreign%* = percentage of foreign sales (Datastream). *ΔSales* =percentage

change in total sales (Datastream). *Float* = percentage of shares available to trade (Datastream). *GW* = goodwill divided by total assets (Datastream). *PPE* = property, plant and equipment divided by total assets (Datastream). *Risk*= 5-year unlevered beta (Datastream). *Size* = natural logarithm of market value of equity (Datastream). *Leverage* = financial debt minus cash and cash equivalent, divided by market value of equity (Datastream). *Change* = 1 if the firm changes external auditor during the fiscal year, and 0 otherwise (Annual report). *Coverage* = natural logarithm of the number of recommendations issued by financial analysts during the year (I/B/E/S). *Capex* = capital expenditures divided by total assets (Datastream). *R* = share return measured from 9 months prior to fiscal year-end to 3 months after fiscal year-end. *X* = earnings per share divided by share price at the beginning of the fiscal year.

Panel C – Frequency of Impairment (*DIMP*) and Transparency (*Score*) by Auditor Pair Type when Market-to-Book Ratio is below One

		DIMP	*Score*
	N	Mean	Mean
Big4_Big4	22	0.455	58.714
Big4_Small	18	0.667	64.300
All	40	0.429	61.227

Panel D – Transparency of Impairment Tests (*Score*) by Auditors Pair Type Conditional on Operating Performance

	Score				
	LowPerf = 0		*LowPerf* = 1		Change
	N	Mean	N	Mean	
Big4_Big4	110	56.721	34	56.112	-0.609
Big4_Small	128	50.669	45	53.873	3.204
All	238	53.454	79	54.837	1.382

Panel E – Transparency of Impairment Tests (*Score*) by Year

	N	Mean	Median	St. Dev
year = 2006	70	50.049	50.800	14.124
year = 2007	81	50.680	51.700	15.780
year = 2008	82	54.839	56.250	16.688
year = 2009	84	58.852	58.300	16.457
All	317	53.836	54.200	16.195

Panel F – Correlation Matrix between Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1 *Big4_Small*	1																						
2 *DIMP*	-0.17***	1																					
3 *Score*	-0.16***	0.12**	1																				
4 *Perf*	-0.06	-0.07	-0.17***	1																			
5 *MtoB*	0.12**	-0.13**	-0.27***	0.22***	1																		
6 *Imp*	-0.03	0.32***	-0.01	-0.01	-0.23***	1																	
7 *Inst*	-0.15***	0.05	0.08	-0.08	0.02	-0.04	1																
8 *Complex*	-0.05	0.03	-0.01	0.30***	0.10*	-0.08	-0.01	1															
9 *DAssets*	0.12**	-0.09*	-0.15***	-0.02	0.09*	-0.05	0.04	0.22***	1														
10 *Foreign%*	-0.08	0.02	-0.04	-0.11*	-0.01	-0.02	0.13**	-0.10*	-0.09*	1													
11 *CrossList*	-0.23***	0.11**	0.14**	0	-0.08	0.06	0.09*	-0.11*	-0.04	0.20***	1												
12 *ΔSales*	0.09*	-0.04	-0.21***	0.23***	0.32***	-0.11*	-0.02	0.39***	0.49***	-0.11*	-0.03	1											
13 *Float*	-0.01	0.10*	0.17***	-0.07	-0.15***	0.12**	0.30***	0.10*	-0.09	0.27***	0.29***	-0.09	1										
14 *GW*	0.01	0.06	0.21***	-0.12**	-0.09	-0.09	0.07	-0.05	0.02	0.12**	0.26***	0.03	0.19***	1									
15 *PPE*	-0.06	-0.09	-0.11*	0.08	0.08	-0.11**	-0.07	0.09	0.14**	0.02	-0.12**	0.07	-0.09	-0.51***	1								
16 *Risk*	-0.27***	-0.09	0.03	0.19***	-0.11**	0.07	-0.04	0.14**	-0.07	0.12**	0.07	0.01	0.01	-0.22***	-0.15***	1							
17 *Size*	-0.42***	0.26***	0.27***	-0.30***	-0.22***	-0.01	0.15***	-0.21***	0	0.12**	0.30***	-0.07	0.13**	0.07	0.07	0	1						
18 *Leverage*	0.11**	-0.01	0.11*	-0.21***	0.04	0.05	-0.02	-0.20***	0.15***	-0.17***	-0.01	0.03	0.02	0.21***	0.06	-0.56***	0.12**	1					
19 *Change*	0.02	-0.01	-0.12**	-0.02	-0.07	0.10*	0.05	-0.02	0.15***	-0.11*	-0.09	0.09	-0.06	-0.11**	0.03	-0.04	0.01	-0.05	1				
20 *Coverage*	-0.28***	0.17***	0.18***	-0.09	-0.05	-0.04	0.15***	-0.13**	-0.11*	0.07	0.36***	-0.10*	0.29***	0.17***	-0.15***	0.09	0.62***	-0.15***	-0.16***	1			
21 *Capex*	0.21***	-0.12**	-0.38***	0.12**	0.15***	-0.02	-0.12**	-0.09	0.09	0.01	-0.15***	0.03	-0.13**	-0.21***	0.36***	-0.10*	-0.25***	0.04	0.07	-0.27***	1		
22 *R*	-0.06	0.02	0.07	-0.06	-0.23***	-0.02	0.02	-0.06	-0.10*	0.06	-0.03	-0.26***	-0.05	-0.01	0.06	0.04	-0.02	-0.05	-0.03	-0.02	-0.05	1	
23 X	-0.06	-0.03	-0.18***	0.20***	0.16***	-0.14**	0.00	0.05	0.21***	0.10*	-0.07	0.35***	-0.03	-0.01	0.10*	-0.03	0.14***	0.03	0.00	-0.08	0.04	-0.03	

*p<.1 (two-sided tests); **p<.05(two-sided tests); ***p<.01 (two-sided tests)

Big4_Small = 1 if one of the two external auditors is a Big 4 auditor and the other is not, and 0 if both external auditors are Big 4 auditors (Annual report). *DIMP* = 1 if the firm books an impairment, and 0 otherwise (Annual report). *Score* = self-constructed measure of transparency of impairment tests (Annual report). *Perf* = EBITDA divided by total assets (Datastream). *MtoB* = market-to-book ratio of equity (Datastream). *Imp%*= impairment charge, if any, divided by intangible assets (Annual report and Datastream). *Inst* = percentage of shares owned by institutional investors (Bloomberg). *Complex* = sales divided by lagged total assets (Datastream). *ΔAssets* = percentage change in total assets (Datastream). *CrossList* = 1 if the company is cross-listed in the US, and 0 otherwise. *Foreign%* = percentage of foreign sales (Datastream). *ΔSales* = percentage change in total sales (Datastream). *Float* = percentage of shares available to trade (Datastream). *GW* = goodwill divided by total assets (Datastream). *PPE* = property, plant and equipment divided by total assets (Datastream). *Risk* = 5-year unlevered beta (Datastream). *Size* = natural logarithm of market value of equity (Datastream). (Datastream). *Leverage* = financial debt minus cash and cash equivalent, divided by market value of equity (Datastream). *Change*= 1 if the firm changes external auditor during the fiscal year, and 0 otherwise (Annual report). *Coverage* = natural logarithm of the number of recommendations issued by financial analysts during the year (I/B/E/S). *Capex* = capital expenditures divided by total assets (Datastream). *R* = share return measured from 9 months prior to fiscal year-end to 3 months after fiscal year-end. *X* = earnings per share divided by share price at the beginning of the fiscal year.

Table 3 –Choice of Auditor Pair: First-Stage Treatment Effect Probit Model

$$\Pr(Big4_Small_t) = f(c + b_1 Inst_t + b_2 Complex_t + b_3 \Delta Assets_t + b_4 CrossList_t + b_5 Foreign\%_{i,t} + b_6 Float_t + b_7 Leverage_t + b_8 Risk_t + b_9 Size_t + b_{10} Perf_t + \varepsilon)$$

	Pred.	Marginal Eff.	z-value	p-value
Inst	-	-0.573***	-3.051	0.002
Complex	?	-0.352***	-2.751	0.006
ΔAssets	?	0.417**	2.463	0.014
CrossList	-	-0.386***	-4.791	0.000
Foreign%	?	-0.194	-1.029	0.304
Float	-	0.687***	3.639	0.000
Leverage	?	-0.092	-1.508	0.132
Risk	?	-0.421***	-5.207	0.000
Size	?	-0.189***	-5.628	0.000
Perf	?	0.719	1.455	0.146
Year fixed effects			Yes	
Sector fixed effects			Yes	
Chi2			162.068	
Pseudo R^2			0.41	
p(Chi2)			0.000	
N			317	

*p<.1 (two-sided tests); **p<.05(two-sided tests); ***p<.01 (two-sided tests)

Table 5 reports results of probit regression and presents marginal effects. Model (1) serves as a first-stage regression in treatment effect models controlling for endogeneity of auditor pairs. z-values are computed with firm-clustered standard errors.

Inst = percentage of shares owned by institutional investors (Bloomberg). *Complex* = sales divided by lagged total assets (Datastream). Δ*Assets* = percentage change in total assets (Datastream). *CrossList* = 1 if the company is cross-listed in the US and 0 otherwise. *Foreign%* = percentage of foreign sales (Datastream). *Float* =percentage of share available to trade (Datastream). *Leverage* = financial debt minus cash and cash equivalent, divided by market value of equity (Datastream). *Risk* = 5-year unlevered beta (Datastream). *Size* = natural logarithm of market value of equity (Datastream). (Datastream). *Perf* = EBITDA divided by total assets (Datastream).

Table 4 –Auditor Pair Type and Unconditional Conservatism (Market-to-Book)

$$MtoB_t = b_0 + b_1 Big4_Small_t + b_2 \Delta Sales_t + b_3 Return_t + b_4 Perf_t + b_5 GW_t + b_6 PPE_t + b_7 Capex_t + b_8 IMR + \varepsilon_t$$

	Pred.	Coeff.	z-value	p-value
Big4_Small	**+**	**0.597****	**2.083**	**0.037**
ΔSales	+	0.946	1.279	0.201
Return	+	0.696***	3.263	0.001
Perf	+	2.121*	1.902	0.057
GW	?	-0.886	-1.572	0.116
PPE	?	-0.200	-0.640	0.522
Capex	+	1.178	0.722	0.470
Hazard:				
IMR	?	-0.353*	-1.738	0.082
Year fixed effects			Yes	
Sector fixed effects			Yes	
R^2			0.26	
Chi2			149.09***	
p(Chi2)			0.000	
N			317	

*p<.1 (two-sided tests); **p<.05(two-sided tests); ***p<.01 (two-sided tests)

Table 4 reports the second stage of a two-stage treatment effect model controlling for endogeneity of auditor pair choice. z-values are computed with firm-clustered standard errors.

MtoB = market-to-book ratio of equity (Datastream). *Big4_Small*= 1 if one of the two external auditors is a Big 4 auditor and the other is not, and 0 if both external auditors are Big 4 auditors (Annual report). *ΔSales* =percentage change in total sales (Datastream). *Return* = share return computed over the fiscal year. *Perf* = EBITDA divided by total assets (Datastream). *GW* = goodwill divided by total assets (Datastream). *PPE* = property, plant and equipment divided by total assets (Datastream). *Capex* = capital expenditures divided by total assets (Datastream). *IMR* = inverse Mills ratio.

Table 5 –Auditor Pair Type and Conditional Conservatism

$$X_t = b_0 + b_1 BN_t + b_2 R_t + b_3 BN * R_t + b_4 Big4_Small_t + b_5 Big4_Small * BN_t + b_6 Big4_Small * R_t + b_7 Big4_Small * BN * R_t + b_8 Size_t + b_9 Leverage_t + b_{10} Risk_t + b_{11} IMR + \varepsilon_{,t}$$

	Pred.	Coeff.	z-value	p-value
BN	-	-0.054***	-3.199	0.001
R	+	0.011	0.654	0.513
*BN * R*	+	-0.023	-0.614	0.539
Big4_Small	?	-0.006	-0.331	0.741
*Big4_Small * BN*	?	0.034	1.639	0.101
*Big4_Small * R*	?	0.01	0.460	0.645
Big4_Small * BN * R	**+**	**0.082***	**1.663**	**0.096**
Size	?	0.009***	2.789	0.005
Leverage	?	0.003	0.798	0.425
Risk	?	0.001	0.893	0.372
Hazard:				
IMR	?	0.000	0.012	0.991
Year fixed effects			Yes	
Sector fixed effects			No	
R^2			0.26	
Chi2			143.00***	
p(Chi2)			0.000	
N			317	

*p<.1 (two-sided tests); **p<.05(two-sided tests); ***p<.01 (two-sided tests)

Table 5 reports the second stage of a two-stage treatment effect model controlling for endogeneity of auditor pair choice. z-values are computed with firm-clustered standard errors.

R = Share return measured from 9 months prior to fiscal year-end to 3 months after fiscal year-end. *BN* = 1 if *R* is negative and 0 otherwise. *X* = earnings per share scaled by share price at the beginning of the fiscal year. *Big4_Small*= 1 if one of the two external auditors is a Big 4 and the other is not, and 0 if both external auditors are Big 4 auditors (Annual report). *Size* = natural logarithm of market value of equity (Datastream). *Leverage* = financial debt minus cash and cash equivalent, divided by market value of equity (Datastream). *Risk*= firm's 5-year unlevered beta (Datastream). *IMR* = inverse Mills ratio.

Table 6 – Auditor Pair Type and Timeliness of Impairment (Probit)

$$\Pr(DIMP_t) = f(c + b_1 Big4_Small_t + b_2 LowPerf_t + b_3 LowPerf * Big4_Small_t + b_4 Size_t + b_5 GW_t + b_6 MtoB_t + b_7 Perf_t + b_8 \Delta Sales_t + b_9 Risk_t + \varepsilon)$$

	Pred.	Marginal Eff.	z-value	p-value
Big4_Small	?	-0.205**	-2.465	0.014
LowPerf	?	-0.215**	-2.254	0.024
LowPerf * Big4_Small	**+**	**0.408*** **	**3.383**	**0.001**
Size	?	0.124***	4.497	0.000
GW	?	-0.210	-1.032	0.302
MtoB	?	-0.046**	-1.959	0.050
Perf	?	-0.606	-1.216	0.224
ΔSales	?	0.053	0.197	0.844
Risk	?	-0.084**	-2.136	0.033
Constant = Pr(DIMP)	?	0.407*	1.830	0.068
Year fixed effects			Yes	
Sector fixed effects			Yes	
Chi2			59.280***	
Pseudo R^2			0.18	
p(Chi2)			0.000	
N			317	

*p<.1 (two-sided tests); **p<.05(two-sided tests); ***p<.01 (two-sided tests)

Table 6 reports results of probit regression and displays marginal effects. z-values are computed with firm-clustered standard errors.

DIMP= 1 the firm books an impairment, and 0 otherwise (Annual report). *Big4_Small* = 1 if one of the two external auditors is a Big 4 auditor and the other is not, and 0 if both external auditors are Big 4 auditors (Annual report). *LowPerf* = 1 if *Perf* is below the 25th percentile of distribution of EBITDA divided by total assets and 0 otherwise (Datastream). *Size* = natural logarithm of market value of equity (Datastream). *GW* = goodwill divided by total assets (Datastream). *MtoB* = market-to-book ratio of equity (Datastream). *Perf* = EBITDA divided by total assets (Datastream). *Risk*= 5-year unlevered beta (Datastream). *ΔSales* = percentage change in total sales (Datastream). *Constant* indicates the average predicted probability of booking an impairment.

We test $b_1 + b_3 = 0$, Chi2(1) = 2.81 p(Chi2) = 0.094 (two-sided test).

Table 7 – Auditor Pair Type and Transparency of Impairment

$$Score_t = b_0 + b_1 Big4_Small_t + b_2 LowPerf_t + b_3 LowPerf * Big4_Small_t + b_4 GW_t + b_5 Float_t + b_6 Risk_t + b_7 Size_t + b_8 Perf_t + b_9 Leverage_t + b_{10} Coverage_t + b_{11} CrossList_t + b_{12} Change_t + b_{13} IMR + \varepsilon_t$$

	Pred.	Coeff.	z-value	p-value
Big4_Small	?	-16.891***	-2.622	0.009
LowPerf	**?**	-5.946*	-1.905	0.057
LowPerf * Big4_Small	**+**	**7.867****	**2.044**	**0.041**
GW	+	10.753**	1.976	0.048
Float	?	8.918**	2.065	0.039
Risk	?	0.820	0.519	0.604
Size	?	-2.279*	-1.749	0.080
Perf	?	-36.330**	-2.587	0.010
Leverage	?	2.789*	1.958	0.050
Coverage	?	2.923	0.889	0.374
CrossList	?	1.159	0.381	0.703
Change	-	-3.344	-0.725	0.468
Constant		63.313***	3.592	0.000
Hazard:				
IMR	?	9.127**	2.374	0.018
Year fixed effects			Yes	
Sector fixed effects			Yes	
R^2			0.22	
Chi2			226.43***	
p(Chi2)			0.000	
N			317	

*p<.1 (two-sided tests); **p<.05(two-sided tests); ***p<.01 (two-sided tests)

Table 6 reports the second stage of a two-stage treatment effect model controlling for endogeneity of auditor pair choice . z-values are computed with firm-clustered standard errors.

Score = self-constructed measure of transparency of impairment tests (Annual report). *LowPerf* = 1 if *Perf* is below the 25th percentile of the distribution of EBITDA/Total Assets, and 0 otherwise (Datastream). *Big4_Small* = 1 if one of the two external auditors is a Big 4 auditor and the other is not, and 0 if both external auditors are Big 4 auditors (Annual report). *Float* = percentage of share available to trade (Datastream). *GW* = goodwill in percentage of total assets (Datastream). *Risk* = 5-year unlevered beta (Datastream). *Size* = natural logarithm of market value of equity (Datastream). *Perf* = EBITDA divided by total assets (Datastream). *Leverage* = financial debt minus cash and cash equivalent, divided by market value of equity (Datastream). *Coverage* = natural logarithm of the number of recommendations issued by financial analysts during the year (I/B/E/S). *CrossList* = 1 if the company is cross-listed in the US and 0 otherwise. *Change* = 1 if the firm changes external auditor during the fiscal year, and 0 otherwise (Annual report). *IMR* = inverse Mills ratio.