Mandatory Audit Firm Rotation and Audit Quality

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Abstract

In a setting where mandatory audit firm rotation has been effective for more than 20 years (i.e., Italy), we analyse changes in audit quality during the auditor engagement period. In our research setting, auditors are appointed for a three-year period and their term can be renewed twice up to a maximum of nine years. Since the auditor has incentives to be reappointed at the end of the first and the second three-year periods, we expect audit quality to be lower in the first two three-year periods compared to the third (i.e. the last) term. Assuming that a better audit quality is associated with a higher level of accounting conservatism, and using abnormal working capital accruals (AWCA) as a proxy for the latter, we find that the auditor becomes more conservative in the last three-year period, i.e. the one preceding the mandatory rotation. These results are confirmed using Basu's (1997) timely loss recognition model. In an additional analysis, we use earnings response coefficients as a proxy for investor perception of audit quality, and we observe results consistent with an increase in audit quality perception in the last engagement period.

Keywords: mandatory rotation, audit firm rotation, audit quality, auditor tenure, auditor conservatism.

JEL codes: M41, M42.

1. Introduction

The debate on the desirability of mandatory auditor rotation (MAR) is far from being resolved. A MAR rule—which sets a limit on the maximum number of years an audit firm can audit a given company's financial statements—has often been proposed as a means to preserve auditor independence and possibly to increase investor confidence in financial reports. In the US, the Government Accounting Office (GAO), which was delegated by the SEC to study the issue of MAR, concluded that there is no clear evidence regarding the potential benefits of a MAR rule (GAO, 2008). However, more recently the Public Company Accounting Oversight Board (PCAOB) issued its *Concept Release on Auditor Independence and Audit Firm Rotation* (PCAOB, 2011) in which the Board solicited public comments on the advantages and disadvantages of mandatory audit firm rotation. In July 2013, the US House of Representatives voted in favor of a bill that rules out MAR. In Europe, the European Commission has recently proposed mandatory rotation for all European listed companies (European Commission, 2011). In April 2013, the European Parliament's Committee on Legal Affairs approved a mandatory rotation rule, but the European Parliament has not yet decided on it.[1]

Notwithstanding the relevance of the issue, there is no univocal evidence that supports or rejects the introduction of a MAR rule to date.

The current paper contributes to the debate surrounding the MAR rule. In particular, we investigate the effects of mandatory audit firm rotation on audit quality, while taking advantage of the unique institutional setting provided by the Italian experience, where a MAR policy has been in place for more than 20 years. This allows us to test the effects of MAR on auditor behavior in a *real* mandatory audit firm rotation environment. Several prior studies have attempted to draw conclusions about the effectiveness of MAR in terms of audit quality. The

majority of the published empirical papers are based on settings where mandatory rotation is not in place. There are few exceptions which are characterized, however, by a number of relevant limitations (Ruiz-Barbadillo et al., 2009; Kim and Yi, 2009; Firth et al., 2012).

It is very important to test the effects of MAR in a real setting, as the incentives of the auditor may be affected by potential future re-appointments. In a voluntary rotation setting there is no limit to future reappointments. By contrast, in a mandatory rotation setting, there is a maximum limit to future re-appointments, causing auditor incentives to change as the maximum limit approaches. Hence, it is only in a mandatory setting (such as the Italian one) that we can properly observe this change in auditor incentives and check how auditor behavior is affected. Indeed, in our research setting, the auditor term can be renewed every three years and can be extended up to a maximum tenure of nine years. This rule was put in place to preserve auditor independence and was based on the assumption that such independence could be compromised by a long-term relationship between auditor and auditee. Therefore, the Italian institutional setting allows us to test the effects of MAR directly in an actual mandatory rotation environment.

In this paper, we investigate how audit quality evolves over the allowed engagement period. We expect auditor incentives and behavior to change as the maximum engagement term gets closer. In particular, as the auditor has incentives to be reappointed at the end of the first and the second 3-year periods, we hypothesize that audit quality is lower in the first two three-year periods compared to the third (i.e. the last) one. In other words, because in the third three-year period there is no longer a possibility that the audit firm can be reappointed and possible litigation issues become more relevant, we expect audit quality to be higher than in the previous two three-year periods (Imhoff, 2003; PCAOB, 2011).

We test this hypothesis on a sample of Italian non-financial listed companies in the period spanning 1985 to 2004.

We assume that better audit quality is associated with a higher level of accounting conservatism, as suggested by several extant papers. Based on prior literature, we employ two different definitions of 'accounting conservatism'. The first one defines accounting conservatism in broad terms as accountants' preference for accounting methods that lead to lower reported levels of earnings (e.g., Belkaoui, 1985). We use signed abnormal working capital accruals as a proxy for this type of conservatism. As a robustness test, we refer to a second definition according to which accounting conservatism consists in an asymmetric verifiability requirement for the recognition of gains *vs.* losses (e.g., Watts, 2003a). To operationalize this second definition we use the well-known Basu (1997) model on conditional conservatism.

Our findings show that auditors become more conservative (i.e. they tend to prefer more conservative accounting) in the third (i.e. the last) 3-year period compared to the previous two. These results, based on abnormal working capital accruals, are also confirmed by the Basu model, which shows that losses are more timely recognized in the last 3-year period than in the first two periods.

The above-mentioned results are complemented by an earnings-returns association test, which documents that investors tend to perceive a better audit quality in the last 3-year engagement period.

Overall, these findings contribute to our understanding of actual and perceived audit quality in a mandatory auditor rotation setting with renewable mandates.

This paper is structured as follows. In section 2, we describe the Italian auditing environment. In section 3, we review prior literature and develop our hypothesis. In section 4, we describe the research method and findings of our main accrual-based analysis. In section 5, the research method and results related to the conditional conservatism analysis are reported. In section 6, the results of the analysis of the market perception of audit quality are reported. We draw conclusions in the final section.

2. The Italian auditing environment

The Italian institutional setting has some distinctive characteristics that make it an appropriate research site with respect to mandatory audit firm rotation.

First, a MAR rule was enforced in Italy in 1975 by Presidential Decree D.P.R. 136/1975. The rule became effective for all listed companies in the mid-1980s[2]. The original version of the regulation (which was the one in place in the period used for the empirical analysis in this paper) allowed an auditor term to be renewed every three years up to a maximum tenure of nine years. This rule implied that Italian listed companies were subject to both a retention and a rotation rule. That is, once appointed, the audit firm was retained for at least three years. At the end of each three-year period, the auditee had the option to reappoint the auditor for an additional term. At the end of nine consecutive years of engagement, a change of audit firm was mandatory. Notwithstanding the option to replace the auditor at the end of each three-year period, a preliminary analysis of our sample shows that the vast majority of listed companies reappointed the incumbent auditor up to the maximum period allowed by the regulation, i.e. nine years.

Recently, the Italian regulation on mandatory auditor rotation has been revised. The latest version of the rule (Legislative Decree 303/2006) drops the option to replace the incumbent auditor at the end of each three-year period. That is, once appointed, the auditor is retained for the maximum engagement period, i.e. nine years.

The time limit set in Italy is not far from the one indicated by the PCAOB in its recent concept release where the Board seeks comments on a number of specific questions regarding MAR, including whether it "should consider a rotation requirement only for audit tenures of more than 10 years" (PCAOB, 2011, p.3). In addition, in 2003 the Conference Board Commission on Public Trust and Private Enterprise recommended that audit committees consider rotation when "the audit firm has been employed by the company for a substantial period of time – e.g., over 10 years" (Commission on Public Trust and Private Enterprise, 2003). Therefore, the time limit set by the Italian regulation (i.e. 9 years) seems to be particularly suitable if we want to test the effects of MAR implementation.

Second, to preserve auditor independence, Italian audit firms are required to avoid providing many types of non-auditing services to listed client firms[3]. This implies that the results obtained using Italian data are less likely to be contaminated by the delivery of non-auditing services, which is another useful feature of the Italian setting for our research purposes.[4]

Third, as regards the legal framework, Italy is a civil law country that, according to Choi and Wong (2007), is generally considered to be characterized by weaker legal enforcement and weaker investor protection than a typical Anglo-Saxon country. Specifically, Italy belongs to the group of code law regime countries with French civil law origins: this group provides weaker legal protection to investors in comparison with German and Scandinavian civil law countries (La Porta et al., 1998). In terms of litigation risk for auditors, based on the Wingate (1997) index – a widely accepted measure of such risk at country level (e.g., Francis and Wang,

2008) – Italy is characterized by a lower litigation risk environment than typical Anglo-Saxon countries. Indeed, Italy is assigned a litigation risk score of 6.22, while Anglo-Saxon countries generally report scores above 10, with a maximum score of 15 for the US. Interestingly, the score assigned to Italy is equal to that assigned to the most important (non-Anglo-Saxon) European countries such as France and Germany, and to that assigned to the Netherlands, Norway, and Switzerland (and higher, for example, than Belgium and Spain). Therefore, in the light of the announced EU reform of the audit market (European Commission, 2011), the Italian data can be considered particularly interesting as the Italian audit setting - especially with reference to the litigation risk for auditors - seems to be similar not only to other code law regime countries with French civil law origins, but also to many (and the most important) European Countries.

Finally, the Italian Stock Exchange Supervisory Commission (Consob) carries out periodic controls on the quality of the auditing activity performed by audit firms, sanctioning audit partners when irregularities in their activity are found. In particular, Consob issues suspensions when there is a suspicion that auditing standards are not properly applied. Over the period between 1992 and 2004, the rate of suspensions of audit partners sanctioned by Consob was 1.42% for the population of listed companies. Although lower than the 1.49% calculated with reference to the US market (based on the data reported by Francis, 2004), this rate is quite significant. What is interesting for the purposes of our study is that 58% of such disciplinary measures in Italy relate to auditors in the first three-year period of engagement, with an incrementally decreasing rate in the following three-year periods (Cameran and Pettinicchio, 2011).

In conclusion, the Italian institutional setting seems to be particularly suitable for testing our hypothesis on the MAR rule, not only because such a rule is actually in place, but also due to its similarities with other major European (and non-European) countries.

3. Literature review and hypothesis development

Mandatory audit firm rotation has been proposed as a potential solution to the possibility that long auditor tenure (i.e. a long auditor-client relationship) may lead to a deterioration of audit quality. The leading argument in favor of mandatory rotation used by both the PCAOB (2011) and the EU (European Commission, 2011) is that auditor independence (and therefore audit quality) would be enhanced by a fixed term on the auditor's appointment. Indeed, a long auditor tenure may lead to the development of a close relationship between client and auditor, which may impair the auditor's objectivity. However, as recognized also by the PCAOB (2011), rotation also brings with it potential negative consequences for audit quality. In particular, the client-specific knowledge gained by audit firms over time may be reduced by the imposition of a MAR rule, and this may result in reduced audit quality in the short-term.

A large number of papers dealing with MAR have been published. The majority of studies on audit firms are based on settings where the rule is not effective, with the few following exceptions. Ruiz-Barbadillo et al. (2009) analyse the Spanish setting, comparing a MAR period (1991-1994) to a voluntary rotation period (1995-2000), and find no evidence of any significant change in audit quality between the two periods. However, in the Spanish setting, MAR was never actually implemented because the rule was dropped before the first audit firm mandatory rotations could take place. In Korea, an auditor change can be imposed by a Financial Supervisory Commission on companies deemed to have high potential to manipulate

accounting results. In this setting, Kim and Yi (2009) find that there is less earnings management following a regulator-imposed audit firm change. However, the authors recognize the uniqueness of the Korean auditor replacement rule and note that their conclusions cannot be generalized to a mandatory rotation setting. Firth et al. (2012) focus on China, a setting where different kinds of rotations (i.e. audit firm and audit partner) are mandatory. Using modified audit opinions, the authors document – under certain conditions -a positive effect of mandatory *audit partner* rotation on audit quality, while no clear benefit is found in relation to mandatory *audit firm* rotation. However, Firth et al. (2012: p.118) clarify that they "classify an audit firm rotation as mandatory if the preceding audit firm changes because of its inability to provide audit services for the client".[5] In other words, most of the MAR cases in their study are not related to the typically-debated type of mandatory audit firm rotation which operates on a periodic basis. Therefore, the Firth et al. (2012) results cannot easily be extended to a typical MAR setting. Recently, Cameran et al. (2013) use the Italian setting to analyze the effects of MAR on rotation costs, focusing on audit fees and engagement hours.

Other studies use the U.S. Arthur Andersen (AA) collapse in 2002 as a mandatory audit-firm rotation setting, with conflicting results (Cahan and Zhang, 2006; Krishnan, 2007; Nagy, 2005; Blouin et al., 2007; Krishnan et al., 2007). However, the forced auditor change following the AA demise shows at least two clear differences from a real mandatory rotation environment. First, the length of the tenure is not limited at the beginning of the engagement. Second, the new audit firm is motivated to audit the new auditee with greater care, because the previous auditor did not have a good reputation for the quality of its work (Cahan and Zhang, 2006).

The majority of other prior studies infer results about MAR using data from settings where audit firm rotation is voluntary. Once again, the results are mixed (Carcello and Nagy, 2004; Chi and Huang, 2005; Chung and Kallapur 2003; Davis et al., 2009; Geiger and Raghunandan,

2002; Gul et al., 2007; Jenkins and Velury, 2008; Johnson et al., 2002; Knechel and Vanstraelen, 2007; Kramer et al., 2011; Myers et al., 2003, Vanstraelen, 2000). As the auditor incentives are different, conclusions drawn from voluntary replacement environments cannot be easily extended to mandatory rotation settings.[6]

From the point of view of the auditor, a MAR setting is significantly different from a voluntary replacement environment. In a voluntary auditor replacement setting, the number of possible future re-appointments for the auditor is ideally equal to infinity. By contrast, in a mandatory rotation setting, the number of potential re-appointments from the existing client declines up to zero as the maximum tenure approaches, causing auditor incentives to change with tenure. Quoting PCAOB (2011: p.12), "had Arthur Andersen in 1996 known that Peat Marwick was going to come in 1997, there would have been a very different kind of relationship between them and Enron."

Prior literature suggests that incumbent auditors are incentivized to retain the client in order to protect their investment in client-specific expertise, with effects on audit quality. For example, in her seminal paper, DeAngelo (1981) assumes that incumbent auditors have economic incentives not to disclose material errors or breaches with a view to retaining their client, thus reducing audit quality. Acemoglu and Gietzmann (1997) show analytically that, if the manager can credibly threaten to dismiss the auditor, then the auditor will choose a low duty of care and will not report discovered errors or breaches in the client's accounting system. Similar conclusions are reached by Wang and Tuttle (2009). Vanstraelen (2000) finds that auditors are more willing to issue an unqualified report in the first two years of the 3-year engagement mandate than in the last year, when the decision to renew the mandate is already taken and known to the auditor.

In a MAR setting, things change. Mandatory rotation affects the auditor's incentives by diminishing the expected future benefits arising from the relationship with the client as the maximum engagement term comes closer. As a consequence, one may expect that audit quality will change over the engagement period. In particular, as long as there is the chance to be reappointed, audit quality is expected to be lower compared to the last term, the one preceding the mandatory rotation, when the auditor – free from re-appointment concerns and knowing that another audit firm will soon take over the audit and might discover any negligence of the previous audit firm – is incentivized to do her job to the best of her ability (Imhoff, 2003).[7]

In the Italian setting, during the time span under analysis, auditors were appointed for a 3-year period and their term could be renewed twice up to a maximum of 9 years. In the first two 3-year periods, therefore, the auditor had the chance to be reappointed, while in the third 3-year period she knew in advance that her engagement would end. Following the line of reasoning described above, we expect to find a lower level of audit quality in the first two terms compared to the third (i.e. the last) one. Hence, we formulate our hypothesis as follows:

Hypothesis: Audit quality is higher in the third (i.e. last) 3-year engagement period.

We measure audit quality in terms of accounting conservatism. Assuming that better audit quality is associated with a higher level of accounting conservatism, we therefore expect the auditor to be more conservative in the last 3-year period.

Based on prior literature, we employ two different definitions of 'accounting conservatism'. The first one defines accounting conservatism broadly as accountants' preference for accounting methods that lead to lower reported levels of earnings (e.g., Belkaoui, 1985). As a robustness test, we use a second definition of conservatism according to which accounting

conservatism consists in an asymmetric verifiability requirement for the recognition of gains *vs.* the recognition of losses (Watts, 2003a).

The association between audit quality and accounting conservatism is well established in the accounting literature (e.g., Basu, 1997; Chung et al., 2003; Watts, 2003a; Ruddock et al., 2006; Francis and Wang, 2008; Cano-Rodriguez, 2010; Li, 2010; Kramer et al., 2011).

Potential litigation concerns generally motivate the auditors to prefer conservative accounting (e.g., DeFond and Subramanyam, 1998; Lys and Watts, 1994; Kim et al., 2003). However, while reducing the risk of litigation, a higher level of conservatism increases the likelihood for an incumbent auditor to be replaced (e.g., Krishnan, 1994; DeFond and Subramanyam, 1998). Therefore, we expect that in the first and second 3-year periods – when the auditor still has the incentive and the chance to be reappointed – the level of auditor conservatism is lower than in the third (i.e. the last) 3-year engagement period. We use signed abnormal working capital accruals (AWCA) as the main proxy for accounting conservatism (and, therefore, audit quality). This proxy allows us to observe the auditor's preference for income-decreasing accounting policies (according to the broad definition of conservatism reported above). Based on the hypothesis, we expect AWCA to be more conservative (i.e. lower) in the third 3-year engagement period. Also, as a robustness test, we employ the conditional conservatism measure proposed by Basu (1997) to proxy for the auditor's requirement for a differential verifiability for the recognition of gains *vs.* losses, i.e. our second definition of conservatism. Again, we expect conditional conservatism to be higher in the third (i.e. last) three-year engagement period.

4. Accrual-based analysis

4.1 Sample

Our sample for the accrual-based analysis is composed of Italian non-financial companies listed on the Milan Stock Exchange. The sample period spans the 20 years from 1985 to 2004. The period post-2004 was excluded in order to avoid the impact of the IFRS adoption.[8]

The data were collected from consolidated financial statements retrieved from two sources: the *Calepino dell'azionista*[9] for the period from 1985 to 1995; and the *Aida* database[10] for the period from 1996 to 2004. For each of the companies included in the sample, the audit firm and the related tenure were traced either from the above data sources or from the *Taccuino dell'azionista*, a periodical publication edited by *Il Sole 24 Ore* (the most popular economic and financial newspaper in Italy).

Only observations with complete financial statements and auditing data were included in the sample. Observations without prior year data were also eliminated to meet the requirement of two consecutive financial statements that are necessary to compute accrual measures.[11]

Moreover, since our purpose is to test whether MAR affects audit quality, we excluded the observations related to companies that did not complete a 9-year mandate with the same audit firm either within the analysed period or later.[12] In addition, firms audited by non-Big audit firms were eliminated in order to ensure that our results were not affected by differential audit quality related to different types of audit firms.[13]

The final sample consists of 1,184 firm-year observations, corresponding to 171 unique firms. On average, each company is included in the sample for around 7 years. A description of the final sample is provided in Table 1.

[Insert Table 1 around here]

The sample covers a wide number of industries and is spread among the different Big-N auditors. It represents 62% of the population of non-financial firms traded on the Milan Stock Exchange during the years under consideration (Borsa Italiana, 2009).[14]

4.2 Model and variables

In order to test our hypothesis, we formulate the following regression model:

$$\begin{aligned} Accruals_{i,t} = {} & \beta_0 + \beta_1 PERIOD\_2_{i,t} + \beta_2 PERIOD\_3_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 CFO_{i,t} + \beta_5 LEV_{i,t} + \beta_6 \\ & SALEGR_{i,t} + \beta_7 ROA_{i,t} + \beta_8 LAGLOSS_{i,t-1} + \beta_9 IPO_{i,t} + \beta_{10} AGE_{i,t} + \beta_{11} DSHR_{i,t} \\ & + \text{fixed effects}_{i,t} + \varepsilon_{i,t}, \qquad (1) \end{aligned}$$

where the subscripts *i* and *t* indicate firm and year, respectively, and fixed effects are firm and year fixed effects.

$Accruals_{i,t}$ is our accrual estimate. As mentioned above, we adopt an accrual-based measure as our main proxy for accounting conservatism. Jones-type abnormal accrual measures (Jones, 1991; Dechow et al., 1995; Kothari et al., 2005) are less appropriate in our case as the number of observations per year/industry is limited (Wysocki, 2004; Peek et al., 2013; Francis and Wang, 2008). Therefore, we measure abnormal working capital accruals (AWCA) as an estimate of abnormal accruals as suggested by DeFond and Park (2001). Accordingly, AWCA is defined as the difference between realized working capital and the working capital required to support the current sales level. Expected working capital is estimated by the historical relationship between working capital and sales. That is:

$$AWCA_t = WC_t - [(WC_{t-1}/S_{t-1}) * S_t], \quad (2)$$

where S_t designates total sales during year t and WC_t is noncash working capital, computed as [(current assets – cash and short-term investments) – (current liabilities – short-term debt)].

AWCA is scaled by the year's total sales.

As our purpose is to measure accounting conservatism, consistent with prior literature AWCA are taken "signed" (e.g., Kim et al., 2003; Cahan and Zhang, 2006). Indeed, higher conservatism translates into lower (i.e. more negative or less positive) accruals (Watts, 2003b). We use raw (signed) AWCA values, positive AWCA values, and negative AWCA values as each of them may provide different insights. Our main audit quality measure—raw (signed) AWCA values—allows us to use the entire sample and to detect an overall shift from less to more conservative accounting policies and *vice versa.* The subsamples of only positive or only negative accruals permit the detection of trends within each of the two possible accounting policies: income increasing and income decreasing.

As our purpose is to analyse how audit quality changes over the auditor engagement period, we divide the maximum allowed engagement period (nine years) into three 3-year periods. Our decision to focus on the 3-year periods is a consequence of the Italian regulation in the time span under analysis, which defined a retention period of three years once the auditor was appointed. As mentioned before, at the end of each 3-year period, the auditor could be reappointed up to a maximum of nine years. Therefore, we introduce three dummy variables (PERIOD_1, PERIOD_2 and PERIOD_3). Each firm-year observation is assigned to one of the three periods based on the service duration of the audit firm. Specifically, PERIOD_1 includes firm-year observations in which audit firms have one to three years of tenure;

PERIOD_2 includes firm-year observations related to four to six years of audit firm tenure; and PERIOD_3 includes observations with seven to nine years of audit firm tenure.

To overcome other related effects, we incorporate additional control variables into the AWCA regression models. These control variables are chosen in accordance with prior related studies. In particular, firm size (SIZE, measured as the natural logarithm of total sales in year t) is used as a control variable because larger firms tend to show lower positive and higher negative accruals (e.g., Myers et al., 2003), therefore a positive sign is expected for negative accruals and a negative sign is expected for positive accruals. Cash flow from operations (CFO, calculated as operating cash flow deflated by total assets) is used because there is a well-documented negative relationship between such variables and accruals (Dechow, 1994; Sloan, 1996; Myers et al., 2003; Francis and Wang, 2008), therefore a negative sign is expected. Leverage (LEV, measured as the ratio of total liabilities to total assets in year t) is used as a proxy for the possibility of debt covenant violations that may create an incentive to increase earnings through higher abnormal accruals, therefore a positive coefficient is expected (Francis and Wang, 2008). According to Johnson et al. (2002) and Carey and Simnett (2006), accruals are likely to be correlated with a company's growth opportunities. Hence, sales growth (SALEGR, calculated as the sales in year t minus sales in t–1 and scaled by sales in year t–1) is also used as a control variable with an expected positive coefficient. Moreover, Dechow et al. (1995) and Kothari et al. (2005) argue that accrual estimation models are generally unable to capture the entire extent of a company's nondiscretionary accruals, and suggest the inclusion of return on assets (ROA, calculated as the ratio of net income over total assets) as an additional variable to control for the accruals' nondiscretionary component that is not extracted by our accrual model. McNichols (2000) shows that there is a positive correlation between ROA and

discretionary accruals, therefore a positive coefficient is expected. According to Francis and Wang (2008), the existence of a loss in the prior year (LAGLOSS, dummy variable assuming value 1 if the firm reported negative income in year t–1, and 0 otherwise) is another proxy for financial distress and bankruptcy risk, and therefore is an incentive to increase reported earnings in the following year (the expected coefficient is positive). The variable IPO (dummy variable assuming value 1 if the firm is classified as an IPO in year t, and 0 otherwise) is included, as prior studies show that firms tend to use accruals to increase reported earnings in the year of the IPO to improve the offering's marketability and to obtain a better price for the new issue (Teoh et al., 1998; Fan, 2007). Thus, a positive coefficient is expected. Similarly, a company's listing age (AGE, calculated as the number of years since the firm's IPO) captures the fact that younger companies are less stable and more likely to encounter financial distress and, consequently, more likely to use accruals to achieve better profitability levels. Therefore, a negative coefficient is expected (e.g., Myers et al., 2003). Finally, due to the particular feature of the Italian setting where concentrated ownership is common even among listed companies, we include an additional variable (DSHR) to control for the presence of a dominant shareholder who owns the majority (more than 50%) of the voting share capital. The variable is calculated as a dummy variable assuming value 1 if the largest shareholder owns more than 50% of the voting shares, and 0 otherwise. We expect companies with a high level of ownership concentration to be less concerned about increasing earnings to achieve short-term market goals (e.g., Prencipe et al., 2011), therefore a negative sign is predicted.

The sources used to calculate all variables based on financial statement data are the *Calepino dell'azionista* and the *AIDA* database. Data about IPOs and ownership structure were collected through the CONSOB website.

4.3 Descriptive statistics

Descriptive statistics for the sample data used for the accrual-based analysis are presented in Table 2.

[Insert Table 2 around here]

Raw AWCA (n = 1,184) are on average slightly positive. It is useful to note that our sample is somewhat balanced between income increasing (n = 612) and income decreasing (n = 572) AWCA. The slight predominance of positive AWCA is consistent with the sample's positive mean and median of the raw (signed) values of AWCA.

About 39% of the sample observations belong to the first three-year audit tenure period, 38% belong to the second three-year tenure period, and 23% belong to the third three-year tenure period, with average auditor tenure (TENURE) of around 4.5 years.

All other variables reported in Table 2 exhibit a sufficient degree of variation within the sample. Interestingly, LEV indicates that Italian companies are on average financed for more than 50% by creditors. Also, in over 80% of the sample companies there is a dominant shareholder who owns more than 50% of the share capital, indicating that ownership is quite concentrated among Italian listed companies.[15] On average, in the sample period, companies report a positive profitability (mean ROA = 0.02) and a positive growth rate (mean sales growth = 0.11). Over 6% of the sample observations went through an IPO in the sample period.

4.4 Univariate analysis

As a preliminary analysis, we compare the mean of raw, positive, and negative AWCA in the three tenure periods. As the Bartlett test rejects the hypothesis of equality of variances among

the three groups, we use the Games-Howell test to check the differences in means.[16] The results are reported in Table 3.

[Insert Table 3 around here]

The Games-Howell test indicates that – except for negative AWCA – the level of accruals is significantly larger in period 1 than in period 3. Also, while there is no significant difference between period 1 and period 2, the difference between period 2 and period 3 is (marginally) statistically significant for the positive accruals proxy. These preliminary results suggest that as auditor tenure increases in a mandatory rotation regime, companies tend to reduce income-increasing accounting policies.

We also analyse the correlation among our variables. The Pearson correlation coefficients are reported in Table 4. Some of these correlations are relatively high, indicating that we could have a problem of multicollinearity. However, we calculated the VIF values for the set of independent variables and they all turned out to be less than 1.62, indicating that the multicollinearity is not a severe issue for our set of variables.

[Insert Table 4 around here]

4.5 Regression analysis

We now turn to our regression analysis. For each of the three estimates of accruals, we estimate model (1).

The results are presented in Table 5, where each of the three definitions of AWCA is used as a dependent variable.

[Insert Table 5 around here]

Given that we have a panel of data, we estimate the model with the firm and year fixed effects. To make sure that our results are not driven by abnormal observations (outliers), we undertake the following procedure. First, we run each regression on the whole sample. For each of these (untabulated) preliminary regressions we compute DFIT statistics, which enable the identification of all those observations that had an abnormally high weight on the original estimation of the coefficients. Then, we rerun each regression on the reduced sample without the respective influential observations. This technique is applied regression by regression. As a consequence, the influential observations may be different for each regression. This explains why the sum of the observations used for negative and positive accruals does not coincide with the number of observations used in the raw accruals regression[17].

Our main variable PERIOD_3 shows a significant and negative sign. This result is consistent with our hypothesis. As mandatory rotation approaches (the third last three-year period does not admit reappointment), companies' accounting policies become more conservative relative to the initial tenure periods. Moreover, the magnitude of the coefficient of PERIOD_3 in the raw AWCA regression implies that AWCA is reduced on average by 1.2% of sales during the third engagement period compared with AWCA during the first engagement period.[18] This result can be considered economically significant as AWCA directly affect operating income. A decrease in AWCA/Sales of 1.2% implies an equivalent decrease in return on sales (ROS, i.e. operating income/sales) which is a very relevant ratio for financial statement analysis.[19] Differently, PERIOD_2 shows an insignificant coefficient, indicating that there is no significant difference in AWCA between PERIOD_1 and PERIOD_2.

The analysis of positive and negative AWCA shows that in both cases PERIOD_3 has a negative and significant coefficient (although the significance is marginal in the case of

positive AWCA), while PERIOD_2 has an insignificant coefficient. Again, these results support the validity of our hypothesis, confirming that – in a MAR setting – the financial reporting policy of companies moves from less conservative in the early years of engagement to more conservative in the last period preceding rotation.

With regard to the control variables, SIZE shows positive coefficients in negative AWCA, in line with expectations, although no significant coefficient is found for positive accruals. The sign of cash flow from operations (CFO) is negative and significant in all regressions, consistent with previously reported results that operating cash flows tend to affect accruals in a negative direction. Against expectations, leverage does not systematically affect AWCA. In fact, both Francis and Wang, (2008) and Becker et al. (1998) find a negative coefficient for LEV, which they suggest may stem from the possibility that financial distress may lead to contractual renegotiations that provide incentives to reduce earnings. Such a possibility might have counterbalanced the expected positive impact of leverage on accruals, rendering the coefficient statistically insignificant. We find results inconsistent with expectations for sales growth (SALEGR), which shows mainly insignificant coefficients. However, this is in line with what was empirically shown by Myers et al. (2003) and Francis and Wang (2008). Similar results were found for AGE, which is confirmed as negatively correlated only to negative AWCA, but shows insignificant coefficients in the other regressions. Such lack of significant impact of AGE on accruals is in line with the results found by Myers et al. (2003). Profitability (ROA) tends to increase abnormal accruals, as suggested by the positive coefficient in all regressions, which is consistent with expectations. Contrary to expectations, however, previous year negative earnings (LAGLOSS) are associated with a more conservative level of accruals, suggesting the tendency to “take a big bath” rather than increasing earnings in the period

immediately following the loss. This might be the consequence of an increased audit risk following a company loss which translates into more conservative reporting. We find confirmation that newly-listed companies tend to apply less conservative accounting policies in the year of the initial public offering, as evidenced by the positive and significant coefficients of IPO in the regressions reported in Table 5. Finally, the variable DSHR is found to be only marginally significantly related to AWCA. A possible explanation may be that various types of dominant shareholders (e.g., family, financial institution, State, etc.) might have different incentives for earnings management, as suggested by prior literature (e.g., Prencipe and Bar-Yosef, 2011). Therefore, the lack of distinction between different types of dominant shareholders might have affected the significance of the results.

5. Robustness tests

5.1 Robustness tests on the accrual-based analysis

To examine the robustness of the results in Table 5, we also estimate the following alternative model:

$$\text{Accruals}_{i,t} = \beta_1 + \beta_2 \text{TENURE}_{i,t} + \beta_3 \text{SIZE}_{i,t} + \beta_4 \text{CFO}_{i,t} + \beta_5 \text{LEV}_{i,t} + \beta_6 \text{SALEGR}_{i,t} + \beta_7 \text{ROA}_{i,t} + \beta_8 \text{LAGLOSS}_{i,t-1} + \beta_9 \text{IPO}_{i,t} + \beta_{10} \text{AGE}_{i,t} + \beta_{11} \text{DSHR}_{i,t} + \text{fixed effects}_{i,t} + \varepsilon_{i,t} \quad (3)$$

where the variable TENURE indicates the number of years of tenure with the same audit firm.

Also in this case we remove influential observations using the DFIT statistics. The results are reported in Table 6.

[Insert Table 6 around here]

The variable TENURE shows a negative and significant coefficient when raw AWCA are used as a dependent variable. This is mainly driven by negative AWCA, which show a negative and significant coefficient. Once again, these results support our hypothesis, suggesting that accounting policies shift from less conservative to more conservative as the tenure increases and the mandatory rotation gets closer.

Moreover, following prior literature (e.g., Myers et al., 2003; Carey and Simnett, 2006), we replace the AWCA measure with current accruals. Current accruals are calculated as noncash current assets minus nonfinancial current liabilities. The results (untabulated) do not change qualitatively, although they show slightly lower levels of significance. Also, we deflate AWCA by total assets instead of sales. Although the results (untabulated) show lower levels of significance, the signs of the coefficients are consistent with those reported in Table 5. As an additional test, we replace the natural logarithm of sales with the natural logarithm of total assets as a proxy for firm size. The results (untabulated) are qualitatively consistent with those reported in Table 5.

As a further robustness test, we replace the variables AGE and TENURE with their natural logarithm. The results (untabulated) are qualitatively unaffected by these changes. Also, the variable DSHR was re-calculated, using 30% or 40% of voting shares as thresholds to define the presence of dominant shareholders. The results (untabulated) remain qualitatively unchanged and DSHR is confirmed as not systematically related to the dependent variable. Finally, we rerun our regressions after excluding the utilities from our sample. The results (untabulated) still hold.

By and large, one may conclude that our hypothesis that audit quality - measured in terms of accounting conservatism and proxied by AWCA - improves as the mandatory rotation gets closer is supported.

5.2 Robustness tests: conditional conservatism analysis

To further test our hypothesis, we turn now to our second definition of accounting conservatism. Accounting conservatism is now defined as an asymmetric verifiability requirement for the recognition of gains *vs.* losses (Watts, 2003a). Note that this type of conservatism tends to translate, on average, into lower accruals (Watts, 2003b; Garcia Lara et al., 2012), therefore the two definitions of conservatism adopted in our study are correlated. Basu (1997) has developed a measure based on the earnings/return relation that allows us to empirically observe this second type of conservatism, which is known as "conditional conservatism". In particular, Basu uses positive market returns as proxy for 'good news' and negative market returns as proxy for 'bad news'. The basic idea underlying this model is that – in the presence of accounting conservatism - earnings are more sensitive to negative market returns (bad news) than to positive ones (good news). Our purpose is to test whether, in a MAR setting, this conditional conservatism is more pronounced in the last (i.e. third) 3-year period. In order to do that, we estimate the following model:

$$EARN_{i,t} = \beta_1 + \beta_2 RET_{i,t} + \beta_3 DRET_{i,t} + \beta_4 DRET_{i,t} * RET_{i,t} + \beta_5 PERIOD\_2_{i,t} + \beta_6 PERIOD\_2_{i,t} * RET_{i,t} + \beta_7 PERIOD\_2_{i,t} * DRET_{i,t} * RET_{i,t} + \beta_8 PERIOD\_3_{i,t} + \beta_9 PERIOD\_3_{i,t} * RET_{i,t} + \beta_{10} PERIOD\_3_{i,t} * DRET_{i,t} * RET_{i,t} + \text{fixed effects}_{i,t} + \varepsilon_{i,t}. \quad (4)$$

where:

$EARN_{i,t}$ = earnings calculated as EPS (earnings per share before extraordinary items) in year t scaled by stock price at the end of t-1.

$RET_{i,t}$ = market-adjusted return, calculated as the difference between the stock return and the market return. Both returns are computed over a period of 12 months, starting nine months before the end of the financial year t (i.e., the financial statements date) and ending three months following it.

$DRET_{i,t}$ is a dummy variable = 1 if $RET_{i,t}<0$, 0 otherwise

$PERIOD\_2_{i,t}$ is a dummy variable = 1 if the audit firm engagement tenure is within the second three-year period (i.e., years 4 to 6), 0 otherwise;

$PERIOD\_3_{i,t}$ is a dummy variable = 1 if the audit firm engagement tenure is within the third three-year period (i.e., years 7 to 9), 0 otherwise;

Fixed effects are industry and year fixed effects.

Our hypothesis states that conservatism increases as the final engagement term gets closer. In model (4) this implies that coefficient β_{10} is expected to be positive.

Market data used for our estimations were retrieved from *Compustat Global*. Due to missing data, our sample for this analysis is reduced to 784 observations. In order to avoid a further reduction in the sample size, we control for outliers by winsorizing the top and bottom 1% of all variables.

Table 7 reports the descriptive statistics of the test variables used for the conditional conservatism analysis and for the market perception analysis (which will be discussed in section 6).

[Insert Table 7 around here]

The descriptives show that market-adjusted returns, earnings, and change in earnings are on average positive over the period under analysis.

The results of estimating model (4) are presented in Table 8.

[Insert Table 8 around here]

Consistent with our expectations, coefficient β_{10} is positive and statistically significant, providing more evidence in support of our hypothesis. Conditional conservatism tends to be higher in the third three-year engagement period, i.e. the one preceding the mandatory audit firm rotation, while there is no significant difference between the level of conditional conservatism between the first and the second three-year periods.

6. Additional analysis: investor perception of audit quality

Next to actual audit quality measures, we also consider audit quality as perceived by the market to test our hypothesis.

There are some previous research that indirectly relates to the rotation issue, focusing on the relation between *perceived* audit quality and audit firm tenure. (Gosh and Moon, 2005; Mansi et al., 2004; Boone et al., 2008; Mai et al., 2008). This research suffers from the same limitations mentioned in section 3 (i.e. evidence drawn from non-MAR settings and conflicting results).

In our paper we, use the Earnings Response Coefficient (ERC) as a proxy for perceived audit quality (Chi et al. 2009; Ghosh and Moon, 2005). The assumption behind the use of such a measure is that the higher the perceived audit quality, the stronger the expected reaction by the

market to the earnings released by the firm. In particular, the ERC is estimated from an earnings-returns association test based on the following regression:

$$RET_{i,t} = \beta_0 + \beta_1 EARN_{i,t} + \beta_2 \Delta EARN_{i,t} + SIZE_{i,t} + LEV_{i,t} + \text{Fixed effects}_{i,t} + \varepsilon_{i,t} \quad (5)$$

where all the variables have been defined before (see Section 6) apart from ΔEARN, which indicates the change in earnings and is calculated as EPS in year t minus EPS in year t-1 scaled by stock price in year t-1.

The ERC is given by the sum of the two coefficients ($\beta_1 + \beta_2$) and indicates how sensitive the market is to accounting earnings.

In order to observe the change in ERC as the final engagement term gets closer, we extend model (5) by including our period dummies and interacting them with each of the basic variables as follows:

$$\begin{aligned} RET_{i,t} = {} & \beta_0 + \beta_1 EARN_{i,t} + \beta_2 \Delta EARN_{i,t} + \beta_3 SIZE + \beta_4 LEV + \beta_5 PERIOD\_2_{i,t} + \beta_6 \\ & PERIOD\_2*EARN_{i,t} + \beta_7 PERIOD\_2*\Delta EARN_{i,t} + \beta_8 PERIOD\_3_{i,t} + \beta_9 \\ & PERIOD\_3*EARN_{i,t} + \beta_{10} PERIOD\_3*\Delta EARN_{i,t} + \text{Fixed effects}_{i,t} + \varepsilon_{i,t}, \quad (6) \end{aligned}$$

An increase in the perceived audit quality should be reflected in positive values for both β_9 and β_{10}.

The ERC results are presented in Table 9.

[Insert Table 9 around here]

The coefficients β_9 and β_{10} show positive and significant values. In particular, the model shows that in Period 3 we have a marginal increase in the ERC compared to the first three-year period of 1.583 (significant at the 1% level), while there is no significant difference between the first and the second three-year periods.

These results show that investor perception of audit quality tends to improve as the final engagement period gets closer. Once more, the results found (indirectly) support our hypothesis.

7. Concluding remarks

A crucial issue in audit regulation is whether to mandate an audit firm rotation. The current study contributes to the ongoing debate surrounding this issue by testing how audit quality changes over the engagement term in a *real* mandatory audit firm rotation setting (Italy), where regulation requires mandatory audit firm rotation on a periodical basis.

We hypothesize that audit quality (in terms of accounting conservatism) tends to improve as the final engagement period gests closer. In our main analysis, we use AWCA to proxy for accounting conservatism defined as the preference for income-decreasing accounting policies. Our empirical results confirm that conservatism (and therefore audit quality) tends to increase in the last engagement period (preceding mandatory audit firm rotation). These results are also confirmed when the Basu (1997) definition and measure of conditional conservatism are used (i.e. conditional conservatism tends to increase in the third - i.e. last - engagement period).

Additionally, using ERC as a proxy for investor perception of audit quality, we find consistent results. Perceived audit quality tends to be higher in the third (i.e. last) three-year period of engagement.

It is interesting to note that recently, in Italy, the option to replace the incumbent auditor at the end of each three-year period has been dropped. This implies that, once appointed, the auditor is now retained for the maximum engagement period, i.e., nine years. In the light of our empirical results, this change seems to move in the right direction to improve audit quality in the early years of the audit firm engagement, because there is no longer the incentive to reduce audit quality with the aim of securing a renewal of the mandate. On the other hand, under the new rotation regime, litigation risk issues tend to be concentrated in the years preceding the end of the mandate, while they become less relevant in the early engagement periods due to the fact there is no more the possibility to change the audit firm after 3 or 6 year. However, due to the low probability for the auditor to be replaced (even when possible) before the maximum allowed engagement period, we expect an overall beneficial effect from the new rotation rules. Further research is needed to confirm this expectation.

We are aware that our conclusions are not easy to generalize to other settings, due to some peculiar characteristics of the Italian environment. In particular, the Italian setting is characterized by a relatively weak legal environment and lower litigation risk for auditors, which might limit the generalizability of our results to stronger legal environments characterized by a higher risk of litigation for auditors, such as the Anglo-Saxon ones. Such higher risk of litigation might reduce the incentive to compromise on audit quality with the purpose of retaining the client in the earlier engagement periods. However, the Italian setting is similar from the institutional point of view to several other European and non-European countries, therefore we believe that our conclusions may still be useful to regulators who intend to evaluate costs and benefits related to the implementation of a mandatory audit firm rotation rule.

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NOTES

[1] The most recent draft agreement between Parliament and Council states that "auditor can inspect a company's books for a maximum 10 years, which may be increased to 10 additional years if new tenders are carried out, and by up to 14 additional years in the case of joint audits". The Parliament vote on the issue is expected in April 2014.
[2] In a first stage, only the largest listed companies were obliged to comply with it (Consob, 1992).
[3] According to the national regulation, audit firms who audit listed companies "may provide services limited to the accounting organization of the firms, as well as auditing services" (Cameran, 2007: p. 155).
[4] Moreover, Cameran (2007) reports that auditing services account for about 90% of revenues of Big audit firms in Italy. Considering the fact that more than 90% of Italian listed companies are audited by Big audit firms (Cameran, 2005), we can assert that financial reporting represents the primary concern of auditors in charge of auditing Italian listed companies.
[5] "For example [...] an audit firm may be sanctioned by the regulators to suspend or cease practice; it may be required by a government agency (e.g., the SASAC) to rotate off the client; or it may have self-liquidated. [...]" (Firth et al., 2012: p.118)
[6] In an attempt to overcome this limitation, some papers have tried to model a MAR setting on a theoretical basis, but again the conclusions are conflicting (Arruñada and Paz-Ares, 1997; Elitzur and Falk, 1996; Gietzmann and Sen; 2002).
[7] This is consistent with what was reported by PCAOB (2011: p.17): "an auditor that knows its work will be scrutinized at some point by a competitor may have an increased incentive to ensure that the audit is done correctly."
[8] Note that there are no 'early adopters' of IFRS in our sample.
[9] Calepino dell'azionista is a yearly publication by one of the major Italian financial institutions (Mediobanca) that contains financial information – including main financial statement data - on all companies quoted on the Italian stock exchanges.
[10] AIDA is the Italian version of Amadeus provided by Bureau Van Dijk, which contained, at the time of our data collection, comprehensive information for more than 500,000 Italian companies, included listed ones.
[11] For example, this is true in cases of companies that acquire other firms. In such a case, the accrual data related to the year of acquisition are excluded because of the lack of comparable data from the previous year.
[12] We excluded those companies that changed the audit firms at the end of the first or the second 3-year engagement period.
[13] Note that over 94% of our initial sample is audited by Big-N audit firms.
[14] Although small in size – our sample represents fairly well the underlying population of non-financial listed companies. Indeed, with few exceptions (e.g., Construction, Electronics, Utilities) the industry distribution for the latter is fairly similar to the one in our sample, that is: Food and beverage = 4.0%; Automotive = 5.9%; Chemical = 12.4%; Construction = 10.6%; Electronics = 13.9%; Machinery = 5.2%; Textile = 12.2%; Media

= 5.3%; Utilities = 8.8%; Transportation-tourism = 9.0%; New Economy = 8.5%; Miscellaneous = 4.0%.

[15] These characteristics of the Italian setting are consistent with those reported in more recent studies on Italian listed companies, e.g., Prencipe and Bar-Yosef (2011).

[16] We use for robustness also the Tamhane's T2 test. The results are qualitatively similar to those reported for the Games-Howell test.

[17] However, we also performed our analysis on a sample of raw accruals observations (1067) made up of the sum of the positive accruals (565) and negative accruals (502) observations. The results (untabulated) are qualitatively similar to those presented in table 5.

[18] Indeed, a coefficient of -0.012 indicates that when the variable PERIOD_3 is equal to 1, the dependent variable (i.e. AWCA deflated by sales) decreases by 1.2% compared to PERIOD_1, taken as a benchmark.

[19] Note that the median (mean) ROS in the sample is about 4.3% (3.5%), therefore a decrease of 1.2% has a significant effect on it.

TABLE 1

Panel A: Sample selection

	No. Obs.
Population of non-financial listed companies (1985-2004)	1,903
- Missing auditor or financial reporting data	464
- Obs. that did not experience MAR	173
- Obs. audited by non-big audit firms	82
Total	***1,184***

Panel B: Sample description

	No. Obs.	**%**
Industries:		
Food and beverage	49	4.1%
Automotive	60	5.1%
Chemical	165	13.9%
Construction	180	15.2%
Electronics	197	16.6%
Machinery	69	5.8%
Textile	138	11.7%
Media	44	3.7%
Utilities	50	4.2%
Transportation-Tourism	116	9.8%
New Economy	83	7.0%
Miscellaneous	33	2.8%
Total	***1,184***	***100%***
Auditors (*):		
Arthur Andersen	231	19.5%
Deloitte	262	22.1%
KPMG	146	12.3%
EY	188	15.9%
PWC	357	30.2%
Total	***1,184***	***100%***

(*) Big-N audit firms are grouped based on the final acquiring firm. E.g., In Italy in December 1999 Coopers & Lybrand (C&L) and Price Waterhouse (PW) merged, creating PricewaterhouseCoopers (PwC): observations included in our sample for which the auditor was C&L or PW are grouped under the PWC label (the name of the audit firm resulting from the merger).

TABLE 2
Descriptive Statistics – Accrual based sample

Variables	n	Mean	Median	Std. Deviation	Minimum	Maximum
Raw AWCA	1,184	0.004	0.003	0.109	-0.464	0.632
Positive AWCA	612	0.077	0.053	0.084	0.000	0.632
Negative AWCA	572	-0.073	-0.047	0.073	-0.464	-0.000
TENURE	1,184	4.505	4.000	2.405	1.000	9.000
PERIOD_1	1,184	0.391	0.000	0.488	0.000	1.000
PERIOD_2	1,184	0.377	0.000	0.485	0.000	1.000
PERIOD_3	1,184	0.232	0.000	0.422	0.000	1.000
SALES	1,184	814	172	3,511	0.030	75,394
CFO	1,184	0.093	0.093	0.092	-0.635	0.519
LEV	1,184	0.533	0.547	0.194	0.044	0.999
SALEGR	1,184	0.111	0.073	0.345	-0.999	6.606
ROA	1,184	0.020	0.029	0.072	-0.886	0.311
LAGLOSS	1,184	0.164	0.000	0.370	0.000	1.000
IPO	1,184	0.065	0.000	0.247	0.000	1.000
AGE	1,184	12.32	6.000	19.56	0.000	128.0
DSHR	1,184	0.806	1.000	0.396	0.000	1.000

Variable definitions:

AWCA = abnormal working capital accruals scaled by total sales

PERIOD_1 = 1 if the audit firm engagement tenure is within the first three-year period (years 1 to 3) and 0 otherwise

PERIOD_2 = 1 if the audit firm engagement tenure is within the second three-year period (years 4 to 6) and 0 otherwise

PERIOD_3 = 1 if the audit firm engagement tenure is within the third three-year period (years 7 to 9) and 0 otherwise

TENURE = years of tenure with the actual audit firm

SALES = total sales (in million Euros)

CFO = operating cash flow scaled by lagged total assets

LEV = ratio of total liabilities to total assets

SALEGR = sales growth rate, calculated as the sales in year t minus sales in t–1 and scaled by sales in year t–1

ROA = return on assets, calculated as net income divided by total assets

LAGLOSS = 1 if the firm reported negative income in year t–1 and 0 otherwise

IPO = 1 if the firm had an IPO in year t and 0 otherwise

AGE = number of years since the firm's IPO

DSHR = 1 if the largest shareholder owns more than 50% of the voting shares and 0 otherwise

Table 3
Mean AWCA and Games-Howell test results

	Raw AWCA	Positive AWCA	Negative AWCA
PERIOD_1	0.011	0.083	-0.073
PERIOD_2	0.003	0.078	-0.072
PERIOD_3	-0.005	0.064	-0.073
		Games-Howell test	
PERIOD_1>PERIOD_2	-1.01	-0.63	0.16
PERIOD_2>PERIOD_3	-1.03	-1.76*	-0.06
PERIOD_1>PERIOD_3	-1.98*	-2.38**	0.09

Variable definitions:

AWCA = abnormal working capital accruals scaled by total sales
PERIOD_1 = mean for the first three-year audit firm engagement period (years 1 to 3)
PERIOD_2 = mean for the second three-year audit firm engagement period (years 4 to 6)
PERIOD_3 = mean for the third three-year audit firm engagement period (years 7 to 9)

Significance levels are one-tailed
* significant at 10%; ** significant at 5%; *** significant at 1%

TABLE 4
Pearson correlation matrix

	Raw AWCA	PERIOD_1	PERIOD_2	PERIOD_3	TENURE	SIZE	CFO	LEV	SALEGR	ROA	LAGLOSS	IPO	AGE	DSHR
Raw AWCA	1.0000													
	(0.0000)													
PERIOD_1	0.0476	1.0000												
	(0.1020)	(0.0000)												
PERIOD_2	-0.0081	-0.6230*	1.0000											
	(0.7800)	(0.0000)	(0.0000)											
PERIOD_3	-0.0456	-0.4408*	-0.4276*	1.0000										
	(0.1166)	(0.0000)	(0.0000)	(0.0000)										
TENURE	-0.0548	-0.8136*	0.1369*	0.7831*	1.0000									
	(0.0595)	(0.0000)	(0.0000)	(0.0000)	(0.0000)									
SIZE	-0.0761*	-0.0296	-0.0250	0.0629*	0.0650*	1.0000								
	(0.0088)	(0.3095)	(0.3896)	(0.0305)	(0.0253)	(0.0000)								
CFO	-0.4956*	0.0118	0.0068	-0.0215	-0.0143	0.1452*	1.0000							
	(0.0000)	(0.6850)	(0.8140)	(0.4600)	(0.6238)	(0.0000)	(0.0000)							
LEV	-0.0216	-0.0481	0.0259	0.0259	0.0546	0.4044*	-0.0947*	1.0000						
	(0.4577)	(0.0978)	(0.3727)	(0.3736)	(0.0605)	(0.0000)	(0.0011)	(0.0000)						
SALEGR	-0.0036	0.1195*	-0.0353	-0.0976*	-0.1252*	0.0177	0.0052	0.0542	1.0000					
	(0.9014)	(0.0000)	(0.2245)	(0.0008)	(0.0000)	(0.5436)	(0.8582)	(0.0622)	(0.0000)					
ROA	0.1022*	-0.0121	0.0135	-0.0015	-0.0013	0.0395	0.3122*	-0.2699*	-0.0917*	1.0000				
	(0.0004)	(0.6768)	(0.6422)	(0.9590)	(0.9630)	(0.1747)	(0.0000)	(0.0000)	(0.0016)	(0.0000)				
LAGLOSS	-0.0882*	0.0006	0.0279	-0.0327	-0.0104	0.0113	-0.1817*	0.2530*	0.0220	-0.5169*	1.0000			
	(0.0024)	(0.9825)	(0.3377)	(0.2603)	(0.7200)	(0.6970)	(0.0000)	(0.0000)	(0.4494)	(0.0000)	(0.0000)			
IPO	0.0695*	0.2940*	-0.1697*	-0.1451*	-0.3105*	-0.0866*	0.0169	-0.0600*	0.0543	0.0977*	-0.0982*	1.0000		
	(0.0167)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0029)	(0.5624)	(0.0390)	(0.0619)	(0.0008)	(0.0007)	(0.0000)		
AGE	-0.0049	-0.1593*	-0.0437	0.2257*	0.2029*	-0.0487	-0.0289	-0.0871*	-0.0669*	-0.0210	0.0443	-0.1662*	1.0000	
	(0.8656)	(0.0000)	(0.1464)	(0.0000)	(0.0000)	(0.0941)	(0.3203)	(0.0027)	(0.0213)	(0.4701)	(0.1280)	(0.0000)	(0.0000)	
DSHR	0.0012	0.0347	-0.0501	0.0173	-0.0150	-0.0224	0.0421	-0.1985*	-0.0183	0.2442*	-0.1979*	0.0256	0.0129	1.0000
	(0.9677)	(0.2323)	(0.0851)	(0.5522)	(0.6073)	(0.4413)	(0.1476)	(0.0000)	(0.5302)	(0.0000)	(0.0000)	(0.3787)	(0.6568)	(0.0000)

* Significant at 5% level or lower.

TABLE 5
Fixed effects regressions with period dummies

	Exp. Sign	Raw AWCA	Positive AWCA	Negative AWCA
Constant		0.043	0.060	-0.373***
		(1.33)	(1.55)	(4.02)
PERIOD_2	?	-0.004	-0.004	-0.009
		(0.90)	(0.83)	(1.74)
PERIOD_3	-	-0.012**	-0.009*	-0.017**
		(2.37)	(2.06)	(2.92)
SIZE	+/-	0.004*	-0.000	0.035***
		(0.83)	(0.09)	(4.62)
CFO	-	-0.956***	-0.634***	-0.573***
		(17.94)	(8.93)	(18.29)
LEV	+	0.018	0.047*	-0.010
		(0.87)	(1.89)	(0.43)
SALEGR	+	-0.018	-0.028	-0.039***
		(0.83)	(1.73)	(5.89)
ROA	+	0.499***	0.367***	0.422***
		(7.24)	(4.70)	(4.47)
LAGLOSS	+	-0.019**	-0.017**	-0.004
		(2.86)	(2.41)	(0.53)
IPO	+	0.024***	0.013**	0.037***
		(5.66)	(2.37)	(4.29)
AGE	-	0.000	0.001	-0.002**
		(0.68)	(1.06)	(2.45)
DSHR	-	-0.019*	0.009	-0.015
		(2.19)	(1.45)	(1.77)
Fixed effects		Yes	Yes	Yes
Observations		1088	565	502
Adjusted R-squared		0.64	0.45	0.41
Prob > F test		0.00	0.00	0.00

Variable definitions: see Table 2

Fixed effects = firm and year fixed effects (untabulated)

Absolute value of t statistics in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

TABLE 6
Fixed effects regressions with tenure

	Exp. Sign	Raw AWCA	Positive AWCA	Negative AWCA
Constant		0.046	0.062	-0.370***
		(1.44)	(1.63)	(4.88)
TENURE	-	-0.001**	-0.001	-0.002**
		(2.25)	(1.39)	(2.25)
SIZE	+/-	0.004*	-0.000	0.035***
		(1.86)	(0.09)	(5.63)
CFO	-	-0.956***	-0.633***	-0.557***
		(18.12)	(8.87)	(12.99)
LEV	+	0.019	0.047*	-0.018
		(0.90)	(1.81)	(0.71)
SALEGR	+	-0.017	-0.028	-0.040***
		(0.83)	(1.71)	(6.18)
ROA	+	0.500***	0.365***	0.408***
		(7.10)	(4.77)	(3.89)
LAGLOSS	+	-0.019**	-0.016**	-0.006
		(2.82)	(2.36)	(0.72)
IPO	+	0.023***	0.013**	0.037***
		(6.14)	(2.59)	(3.84)
AGE	-	0.000	0.001	-0.002**
		(0.54)	(1.04)	(2.60)
DSHR	-	-0.019**	0.009	-0.015
		(2.22)	(1.43)	(1.63)
Fixed effects		Yes	Yes	Yes
Observations		1088	567	505
Adjusted R-squared		0.64	0.45	0.39
Prob > F test		0.00	0.00	0.00

Variable definitions: see Table 2
Fixed effects = firm and year fixed effects (untabulated)

Absolute value of t statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

TABLE 7
Descriptive Statistics – Market returns sample

Variables	n	Mean	Median	Std. Deviation	Minimum	Maximum
RET	784	0.037	-0.019	0.516	-1.365	7.893
EARN	784	0.027	0.049	0.281	-6.823	1.002
ΔEARN	784	0.007	0.003	0.124	-0.547	0.866
PERIOD_1	784	0.335	0.000	0.472	0.000	1.000
PERIOD_2	784	0.411	0.000	0.492	0.000	1.000
PERIOD_3	784	0.254	0.000	0.435	0.000	1.000

Variable definitions:

RET = Market adjusted returns

EARN = Earnings scaled by price

ΔEARN = change in earnings scaled by price

PERIOD_1 = 1 if the audit firm engagement tenure is within the first three-year period (years 1 to 3) and 0 otherwise

PERIOD_2 = 1 if the audit firm engagement tenure is within the second three-year period (years 4 to 6) and 0 otherwise

PERIOD_3 = 1 if the audit firm engagement tenure is within the third three-year period (years 7 to 9) and 0 otherwise

TABLE 8
Basu model of conditional conservatism
Dependent variable = EARN

	Exp. sign	Coefficient
Constant		0.0299**
		(2.32)
RET	+	0.117***
		(2.72)
DRET	?	-0.016
		(1.23)
DRET*RET	+	-0.083
		(1.21)
PERIOD_2	?	0.017
		(1.141)
PERIOD_2*RET	?	-0.053
		(1.001)
PERIOD_2*DRET*RET	?	0.0968
		(1.054)
PERIOD_3	?	0.030*
		(1.76)
PERIOD_3*RET	?	-0.0870
		(1.46)
PERIOD_3*DRET*RET	+	0.268**
		(2.41)
Fixed effects		Yes
Observations		784
R-squared		0.086
Ftest		6.55
Prob > Ftest		0.00

Variable definitions*:*

EARN = Earnings scaled by price
RET = Market adjusted returns
DRET = 1 if RET<0 and 0 otherwise
PERIOD_2 = 1 if the audit firm engagement tenure is within the second three-year period (years 4 to 6) and 0 otherwise
PERIOD_3 = 1 if the audit firm engagement tenure is within the third three-year period (years 7 to 9) and 0 otherwise
Fixed effects = Industry and year fixed effects (untabulated)

Absolute value of t statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

TABLE 9
Earnings-Returns Association Regressions
Dependent variable = RET

	Exp. sign	Coefficient
Constant		0.092
		(0.18)
EARN	+	0.304*
		(1.66)
ΔEARN	+	0.876***
		(4.04)
SIZE	?	0.010
		(0.73)
LEV	?	-0.065
		(0.55)
PERIOD_2	?	0.022
		(0.53)
PERIOD_2*EARN	?	-0.169
		(0.86)
PERIOD_2*ΔEARN	?	0.010
		(0.03)
PERIOD_3	?	0.106**
		(2.15)
PERIOD_3*EARN	+	0.763**
		(2.02)
PERIOD_3*ΔEARN	+	0.820*
		(1.74)
Fixed effects		Yes
Observations		784
Adjusted R-squared		0.15
Prob > F test		0.00
ERC		1.180***
PERIOD_3 *ERC		1.583***

Variable definitions*:*

RET =	Market adjusted returns
EARN =	Earnings scaled by price
ΔEARN =	change in earnings scaled by price
SIZE =	natural logarithm of total sales
LEV =	ratio of total liabilities to total assets
PERIOD_1 =	1 if the audit firm engagement tenure is within the first three-year period (years 1 to 3) and 0 otherwise
PERIOD_2 =	1 if the audit firm engagement tenure is within the second three-year period (years 4 to 6) and 0 otherwise
PERIOD_3 =	1 if the audit firm engagement tenure is within the third three-year period (years 7 to 9) and 0 otherwise
Fixed effects =	Industry and year fixed effects (untabulated)

Absolute value of t statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%