Accounting conservatism and the limits to earnings management

Juan Manuel García Lara
Universidad Carlos III de Madrid

Beatriz García Osma
Universidad Autónoma de Madrid

Fernando Penalva[†]
IESE Business School, University of Navarra

This draft: February 2015

[†] Corresponding author. IESE Business School, University of Navarra, Av. Pearson, 21, 08034 Barcelona, Spain. E-mail: penalva@iese.edu. Tel. (+34) 93 253 4200, Fax. (+34) 93 253 4343.

We thank Bill Rees, Alfred Wagenhofer, Fengyun Wu, Steve Young and seminar participants at Lancaster University, London School of Economics, ESSEC Business School Paris, HEC Université de Lausanne, Universitat Pompeu Fabra, Universidad de Valencia, WHU Otto Beisheim School of Management, Universidade de Porto, University of Graz, Cass Business School, the European Accounting Association annual congress, the American Accounting Association annual meeting, the Workshop on Empirical Research in Financial Accounting, and the 9th Workshop on European Financial Reporting for their comments and suggestions. We acknowledge financial assistance from the Spanish Ministry of Innovation and Science (ECO2010-19314 & ECO2013-48328).

Accounting conservatism and the limits to earnings management

Abstract

An untested common assumption in prior literature is that conservatism reduces accruals-based earnings management. We test this prediction and also, whether by imposing limits to accruals manipulation, there is a downside to conservatism in the form of increases in real earnings management. If the incentives to engage in earnings management stay constant, it is likely that when managers face constraints to manipulate accruals, they may shift to potentially more costly real earnings management practices (Ewert and Wagenhofer [2005], Zang [2012]). Using a large US sample for the period 1991-2010 we find a negative association between conservatism and measures of accruals manipulation, and a positive association between conservatism and real earnings management. However, our evidence is consistent with only a moderate displacement effect and with conservatism constraining earnings management overall.

Keywords: *Conservatism, earnings asymmetric timeliness, earnings management, manipulation of real operating activities*

Data Availability: *Data is available from the sources identified in the paper.*

JEL Classification: *G10, G31, M41.*

1. Introduction

We study the association between conservatism in accounting and both accruals and real earnings management. Conservatism is the consequence of the asymmetric verifiability requirements for the recognition of economic gains and losses, which result in accounting information that reflects economic losses in a timelier manner than gains (Basu [1997]).[1] A common untested assumption in prior literature is that conservatism imposes limits to accruals-based earnings management (e.g., Ball [2001], Kothari et al. [2010]). For example, Watts [2003] argues that an important role of conservatism is to constrain management's opportunistic financial reporting behavior, and to offset biases introduced by self-interested parties, and LaFond and Watts [2008, 448] argue that conservatism reduces managerial ability to "manipulate and overstate financial performance."

This view is however not without criticism. Opponents to conservatism note that the intentional, news-unrelated, understatement of net assets in the balance sheet may provide managers with opportunities to inflate earnings through subsequent reversals of those understatements. In agreement with this view, Jackson and Liu [2010] show that the overstatement of the allowance for uncollectible accounts provides opportunities to build up 'reserves' on the balance sheet, and the work of Barton and Simko [2002] provides evidence that the overstatement of net assets restricts future income-increasing earnings manipulation.

A careful examination of these opposing views reveals a discrepancy in the notion of conservatism underlying these claims. In this paper, we define conservatism as conditional conservatism, and in line with the analytical work of Chen et al. [2007], we argue that

---

[1] Starting with Beaver and Ryan [2005] prior literature refers to this type of conservatism as conditional conservatism. The paper focuses exclusively on conditional conservatism.

conditional, news-related, conservatism limits earnings management because it dampens managerial incentives to manipulate earnings. Firms with a past record of conditional conservatism enjoy benefits such as easier access to debt financing and at a lower cost (Ahmed et al. [2002]; Zhang [2008]; Wittenberg-Moerman [2008]; Göx and Wangenhofer [2009]; Gormley et al. [2012]; Jayaraman and Shivakumar [2013]), and of equity financing (Suijs [2008]; Garcia Lara et al. [2011]). We expect that when firms with a past record of conservatism break their commitment to conservatism, they risk losing the conservatism-related benefits that they currently enjoy. That is, conservatism imposes additional costs to managing earnings. Thus, we expect more conditionally conservative firms to manage earnings through accruals to a lower extent than firms without a prior commitment to conservative accounting.

However, to the extent that insiders' incentives for earnings management are not dampened entirely, the costs that conservatism imposes to accruals-based earnings management may trigger a trade-off effect, leading to greater manipulation of real activities. Zang [2012] shows that managers trade-off accruals-based and real earnings management actions, depending on the expected benefits and costs of both types of manipulation. In line with this idea that managers trade-off accruals and real earnings management, Ewert and Wagenhofer [2005] analytically demonstrate that accounting standards designed to limit accruals-based manipulation have the undesired side-effect of increasing real earnings management. Also, consistent with the wider view that governance practices that constrain accruals-based manipulation lead to increased real earnings management, Cohen et al. [2008] provide empirical evidence that the passage of the Sarbanes-Oxley Act (SOX) led to a decrease in accrual-based earnings management but also to an increase in real earnings manipulation, indicating that firms switched instruments, but continued manipulating earnings, after SOX.

Following this line of research, we investigate the aggregate consequences of conservatism on both types of earnings management and whether there is a downside to accounting conservatism in the form of real earnings management that may perhaps explain regulators and other pressure groups reticence to conservatism. If the disciplining role of conservatism limits accrual-based manipulation by increasing its costs, it may increase the marginal benefits of manipulating real operating, investing and financing activities. In that case, we should observe that greater conservatism leads to increases in real earnings management.

Using a large sample of US firms for the period 1991-2013 we test these predictions on the links between conservatism and both real and accruals earnings management. To conduct our tests, we construct and validate a firm-specific measure of conditional conservatism based on the proxies developed by Givoly and Hayn [2000], Khan and Watts [2009] and Callen et al. [2010]. Then, we create measures of accruals-based manipulation using Jones [1991] type models, and of real earnings management following the work of Roychowdhury [2006]. Using these proxies, we study the association between conservatism and earnings management. Our tests yield the following key findings. We show that conservatism is associated with decreased accruals earnings management, in line with the arguments in Watts [2003] and LaFond and Watts [2008]. To the best of our knowledge, there is no prior empirical evidence on this association. Only the work of Jackson and Liu [2010] empirically studies the association between conservatism and earnings management, but focusing on tests of news-unrelated unconditional conservatism.

Second, we find that increased conservatism is associated with greater real earnings management. We interpret this finding as an indication that keeping reporting incentives constant, increasing the costs of accrual-based manipulation leads to a switch amongst earnings management instruments, and to increases in real earnings management.

To assess the net effect of conservatism on earnings management (either through accruals-based or real decisions) we analyze whether conservatism decreases the overall probability that a firm manipulates its financial statements by using either instrument. The results from this test provide empirical evidence that more conservative firms have a lower probability of being suspect of having engaged in earnings management (of any type) to meet or beat earnings benchmarks. This indicates that, in terms of the aggregate level of earnings management, the displacement from one type of manipulation to the other is moderate and that, overall, conservatism serves to constrain earnings management. This is in agreement with the arguments in Chen et al. [2007, 542], who show that conservatism need not offset opportunistic biases by imposing explicit constraints in accounting standards, but rather, that it lowers earnings management "by dampening firm insiders' incentives to manage earnings."

We contribute to the literature along several dimensions. First, we provide empirical evidence of a negative relation between conservatism and accruals earnings management, consistent with prior theoretical arguments in Watts [2003] and LaFond and Watts [2008], and with the analytical evidence in Chen et al. [2007] and Gao [2013]. Second, we show that conservatism triggers a substitution effect between accruals and real earnings management. We thus add to the evidence in Cohen et al. [2008], Badertscher [2011], Zang [2012] and Wongsunwai [2013] on the determinants of the trade-offs between accruals-based and real earnings management. Finally, we also provide new evidence on the consequences of conservatism in accounting, contributing to the ongoing regulatory and academic debate on whether conservatism is a desirable characteristic of accounting information. Our results that more conservative firms are less likely to beat earnings targets through earnings management of either type are consistent with conservatism not only improving contracting efficiency (as shown

in a large number of studies, including those of Ahmed et al. [2002]; Zhang [2008]; Göx and Wangenhofer [2009]; Gormley et al. [2012]), but also, with conservatism improving the firm information environment by reducing earnings management. Earnings management complicates equity valuation as it conceals the company actual performance and masks underlying trends in revenue and earnings growth that are important to build expectations of future growth and product demand (McNichols and Stubben [2008]). Thus, we show that, consistent with LaFond and Watts [2008] and García Lara et al. [2014], conservatism plays also a positive informational role.

The remainder of the paper is structured as follows. Section 2 contains the discussion on the expected relation between conservatism and earnings management. Section 3 describes the research methods and the empirical measures that we use in our tests. Section 4 presents the data and the empirical results, and an assessment of the construct validity of the conservatism measure used in the main tests. Finally, Section 5 summarizes the findings and concludes.

2. Conservatism and the limits to earnings management

2.1. REAL VERSUS ACCRUALS-BASED EARNINGS MANAGEMENT

Accrual accounting is at the core of the financial reporting system and involves a myriad of judgments and estimations. Extant research shows that managers use the discretion inherent to accrual calculation to alter accounting numbers both for opportunistic and informative purposes. Earnings management occurs when managers use this flexibility with the intent to mislead firm

stakeholders about the underlying true economic performance of the firm.[2] Aside from this (purely accounting) accrual-based type of manipulation, earnings can also be managed by strategically timing and structuring transactions. This manipulation is denoted real earnings management, as it involves real operating, investment or financing decisions (Schipper [1989]). For example, management may opportunistically increase earnings by reducing research and development and other discretionary expenses (Bushee [1998]), by strategically timing the sale of some assets (Herrmann et al. [2003]), by increasing production to decrease unit costs, or by increasing credit sales or aggressively offering discounts (Roychowdhury [2006]).

Each type of manipulation has its associated benefits and costs. In terms of visibility and accountability, management likely prefers real earnings management, since managers have to answer for any accounting decisions that lead to earnings that fail to accurately reflect true economic performance before auditors, corporate boards, audit committees, shareholders, and even courts (Lo [2008]). It is however less likely that they have to respond for difficult-to-monitor operating, investment or financing decisions that fully fall within their responsibilities and for which outsiders find it nearly impossible to estimate deviations from optimal behavior.

In terms of firm value, real manipulation often involves suboptimal decisions, making it a costly type of manipulation (Bhojraj et al. [2009]; Cohen and Zarowin [2010]) and therefore, potentially, a last resort for managers. However, in the presence of persistent earnings management incentives and sufficiently strict monitoring over the financial reporting system, managers may opt to manipulate real decisions to meet their earnings goals, regardless of the associated costs, particularly, given its lower visibility. The survey study conducted by Graham

[2] See Healy and Wahlen [1999] and Dechow and Skinner [2000] for reviews of the earnings management literature.

et al. [2005] confirms this view that managers may in fact prefer real to accrual-based earnings management. That survey was conducted, however, in a period of increased accounting scrutiny, right after the spate of accounting scandals that led to the demise of Arthur Andersen and the passage of SOX. Hence, at that time, managers were likely immersed in the switch from accruals to real earnings management that is documented in Cohen et al. [2008]. In fact, Cohen et al. make precisely that argument, and suggest that firms switched to real activities manipulation because, although it is potentially more costly for the firm, it is less costly for managers, as it is harder to detect or, at least, to question. The evidence in Cohen and Zarowin [2010], Badertscher [2011], Zang [2012] and Wongsunwai [2013] confirms this view that managers choose among instruments depending on their expected net benefits.

2.2. CONSERVATISM

Recent literature assumes but does not provide empirical evidence that conservatism reduces accrual-based earnings management (e.g., Watts [2003], Guay and Verrecchia [2006], LaFond and Watts [2008]). It is argued that because conservatism defers the recognition of gains and constrains the overstatement of earnings and assets, under conservative accounting managers find it more difficult to manipulate earnings, for example, to attain increases in compensation or to avoid violating debt covenants or missing earnings targets. While there seems to be a consensus in the literature that conditional conservatism, enforced through accounting standards, constrains managerial misbehavior and avoids the overstatement of cumulative earnings in the long run, there is less of a consensus on the short term effects of conservatism at the firm level.

Opponents to conservatism argue that more conservative firms may report lower current earnings at the expense of higher future earnings. If managers are able to time in their own

benefit the increase in future earnings, this would create opportunities for more conservative firms to manage earnings. For example, conservative firms are less likely to have bloated balance sheets. In turn, less bloated balance sheets provide more opportunities for earnings management (Barton and Simko [2002]; Zang [2012]). Alternatively stated, it is sometimes argued that if firms opportunistically understate their net assets, they may build up 'reserves' on the balance sheet and subsequently draw on those reserves to manage earnings.

The work of Jackson and Liu [2010] provides evidence that managers purposely overstate the allowance for uncollectible accounts, understating net assets. Subsequently, managers can reverse those overstatements of the allowance to increase future earnings by managing bad debt expense downward, and in some cases, even record income-increasing bad debt expenses. This purposeful understatement of net assets, unrelated to bad news about the true probability of bad debt and uncollectible accounts is however not conditional conservatism, which refers to the timely recognition of losses (i.e., recognizing losses when they occur and using the best estimate of their underlying true amount). Overstating the recognition of losses, or recording losses before they occur is akin to income-decreasing earnings management, or in the extreme, to big bath accounting. Such managerial behavior may perhaps fall under the umbrella of unconditional conservative practices, which refer to the news unrelated understatement of net assets. They would not be conditional conservative practices. Indeed, extant prior literature indicates that unconditional conservatism is negatively associated with conditional conservatism (Pope and Walker [1999], Beaver and Ryan [2005]). Also, the literature suggests that unconditional conservatism can have negative consequences by creating a negative bias of unknown magnitude in net assets that can be difficult to unravel (Ball and Shivakumar [2005]), whilst conditional conservatism is associated with improvements in the firm information environment (LaFond and

Watts [2008], García Lara et al. [2014]). Thus, we predict that conditional conservatism does not create these "cookie jar reserves," because it recognizes losses that occur in the period, or anticipates the recognition of bad news that, on average, occur in the next period.

2.3. CONSERVATISM AND THE INCENTIVES FOR EARNINGS MANAGEMENT

We argue that the mechanism through which conditional conservatism constrains earnings management is through imposing additional costs to the firms that manage earnings. Prior research provides evidence that firms with a past record of conservative reporting have easier access to debt financing and improved credit terms (Ahmed et al. [2002]; Zhang [2008]; Wittenberg-Moerman [2008]; Göx and Wangenhofer [2009]; Gormley et al. [2012]; Beyer [2012]; Jayaraman and Shivakumar [2013]). Firms that commit to conditional conservatism are also rewarded with a lower cost of equity capital (Suijs [2008], Garcia Lara et al. [2011]). These rewards to more conservative firms in the form of easier access to debt financing and decreases in the cost of debt and cost of capital are expected to disappear or be substantially reduced for conservative firms that deviate from their conservative reporting to manage earnings to, for example, beat an earnings benchmark. Thus, the desire to maintain these conservatism-related benefits is expected to lower the benefits of earnings management and thus, lower its incidence.

While the relation between conservatism and accrual-based earnings management has been discussed in prior work, the links between conservatism and real earnings management have not attracted similar attention. Prior research has focused on the broader topic of the links between constraints to accruals-based earnings management, and how these constraints, in the form of tighter accounting standards or monitoring, lead to real earnings management. In particular, Demski [2004] and Ewert and Wagenhofer [2005] provide analytical evidence that, in

the presence of tighter accounting standards, there is a substitution effect between accrual-based and real earnings management. The explanation for this substitution is that tighter monitoring increases the marginal benefits of real earnings management (Ewert and Wagenhofer [2005]), or alternatively stated, it lowers the disutility associated with engaging in real earnings management (Demski [2004]). The empirical evidence in Cohen et al. [2008] is consistent with this view, and indicates that following the passage of SOX, which included governance provisions aimed at strengthening the monitoring over the financial reporting system, accrual-based manipulation declined while real earnings management increased significantly. In line with this evidence, we expect conservatism to increase the costs of accruals-based earnings management, thereby increasing the marginal benefits of real activities manipulation. Thus, conservatism may trigger a substitution effect between accruals-based and real earnings management.

The predicted trade-off between real and accruals-based manipulation could be interpreted as a costly consequence of conservatism in accounting, raising the issue of what is the net impact of conservatism on the aggregate level of earnings management. Given that there is evidence that firms with better corporate governance structures and more stringent monitoring over the financial reporting system present more conservative accounting numbers (Beekes et al. [2004]; Ahmed and Duellman [2007]; Garcia Lara et al. [2009]; Ramalingegowda and Yu [2012]), it could be argued that managers in more conservative firms have less room to switch from accrual-based to real earnings management, as independent directors and institutional investors are expected to monitor not only the financial reporting system, but also real operational decisions that affect long-term firm value. This argument is consistent with the results in Roychowdhury [2006] and Zang [2012] that firms with institutional investors engage less in real earnings management. However, we cannot discard the opposite explanation that

independent directors that are better suited for monitoring the financial reporting system might be less able to understand the long-term effects of operational decisions, opening the door for real earnings management. The results in Faleye et al. [2011] that increased board monitoring reduces accrual-based earnings management but also innovation are consistent with this second view. Thus, the aggregate effect of conservatism over earnings management is ultimately an empirical question of interest.

3. Research design

We study whether conservatism is differently associated with accrual-based *versus* real earnings management. We first present the models used to test this association and discuss the choice of control variables. Then, we describe the proxies for earnings management, and the proxy used to measure conditional conservatism at the firm-year level. Finally, we describe the sample used to test our predictions and validate our conservatism proxy. To assess the relationship between conservatism and earnings management, we use the following two equations:

$$RM_t = \alpha + \beta_1 CO_t + \delta \sum InnateDet\_CO_t + \gamma \sum TradeOff\_RMvsAM_t + \varepsilon_t \quad (1.a)$$

$$AM_t = \alpha + \beta_1 CO_t + \delta \sum InnateDet\_CO_t + \gamma \sum TradeOff\_RMvsAM_t + \varepsilon_t \quad (1.b)$$

where *RM* and *AM* are our real and accrual-based earnings management proxies, *CO* is the accounting conservatism proxy, and *t* is the time-period indicator. *InnateDet_CO* is a vector of control variables that capture the innate determinants of conservatism and *TradeOff_RMvsAM* is a vector of control variables that measure the costs of and incentives for engaging in either type of manipulation, and that determine the trade-offs between the two. If conservatism decreases accrual-based earnings management, we should observe that greater levels of conservatism are

associated with lower accrual-based earnings management, and thus, we expect that β_1 in model (1.b) will be negative and significant. At the same time, if conservatism leads to increases in the manipulation of real operations, we expect to see a positive association between our measure of real earnings management and *CO* ($\beta_1 > 0$) in model (1.a). Following Petersen [2009], we estimate this regression in a pooled fashion and report *t*-statistics based on standard errors that are robust to heteroskedasticity, serial and cross-sectional correlation with a two dimensional cluster at the firm- and year-level. All regressions include fiscal-year indicator variables.

To study the net effect of conservatism over the aggregate level of earnings management, we focus on a well-established output of manipulation: the probability that a firm beats marginally its earnings benchmarks. Anecdotal evidence as well as a number of prior studies provide evidence on the existence of significant market rewards associated with meeting or beating earnings targets (Skinner and Sloan [2002]; Bartov et al. [2002]). And so, perhaps unsurprisingly, the extant evidence reports clear discontinuities in the earnings distribution around these benchmark points, suggesting that managers avoid reporting losses, earnings decreases and disappointing financial analysts (Burgstahler and Dichev [1997], Degeorge et al. [1999]). Following this line of research, we study the probability that a firm meets or beats marginally one of these benchmarks, conditional on its level of conservatism. To do so, we use the following logit model:

$$Prob\ (Suspect=1) = \alpha + \beta_1\ CO_{t-1} + \delta \sum InnateDet\_CO_t + \gamma \sum Controls_t + \varepsilon_t \qquad (2)$$

where *Suspect* is a dummy variable that takes the value of one if the firm is classified as having a high probability of having engaged in earnings management, since it narrowly beats or meets an earnings benchmark; and zero if it is a non-suspect firm, because it clearly beats or misses all the benchmarks. These firms are selected following the criteria in Roychowdhury [2006] and Zang

[2012]. Suspect firms are either a) firm-years with earnings before extraordinary items over lagged assets between 0 and 0.005; b) firm-years with an increase in basic EPS excluding extraordinary items from last year between zero and two cents; or c) firm-years with actual EPS exceeding by up to one cent the last analyst forecast consensus before the fiscal year end. Non-suspect firms are those with a low probability of having engaged in earnings management. They are defined as follows: a) firm-years that miss or beat the zero earnings benchmark by more than 2.5% of lagged total assets; b) firm-years that miss or beat last-year EPS by more than five cents; and c) firm-years that miss or beat analyst forecast consensus by more than five cents. Therefore, the dependent variable of model (2) equals one if the firm is suspect and zero if the firm is non-suspect. If conservatism lowers the overall probability that firms engage in earnings management, we expect that β_1 in model (2) will be negative and significant.

Model (2) also incorporates a vector of control variables that account for other factors that affect the probability of reporting earnings that meet or beat the targets. In particular, we control for a) corporate governance characteristics, b) whether the firm is a habitual beater or c) it issues equity in the following fiscal year. We also control for d) the number of shares outstanding, e) firm performance, and f) the innate determinants of conservatism (*InnateDet_CO*). Finally, we include fiscal-year indicator variables and estimate the model using robust standard errors based on a two dimensional cluster at the firm and year level. The following sections describe in detail the different variables used in models (1) and (2).

3.1. EARNINGS MANAGEMENT MEASURES

We use three measures of accruals earnings management (*AM*): (i) discretionary accruals obtained from (i) the modified Jones [1991] model, as proposed by Dechow et al. [1995]

(DA_Modified Jones), and (ii) the lagged model (DA_Lagged Model) and (iii) the adapted model (DA_Adapted Model), both discussed in Dechow et al. [2003]. To measure real earnings management, we use the proxies in Roychowdhury [2006]: abnormal production costs and abnormal discretionary expenses, and combine them into a single measure (*RM*). In the next subsections, we explain the calculation of each of these proxies.

3.1.1. Accrual-based earnings management proxies

Our first proxy *AM* is based on the residuals of the modified Jones model (Dechow et al. [1995]):

$$TAccr_t / Assets_{t-1} = \alpha + \beta_0 1/Assets_{t-1} + \beta_1 (\Delta Sales_t - \Delta REC_{it}) / Assets_{t-1} + \beta_2 PPE_t/Assets_{t-1} + \beta_3 ROA_{t-1} + \beta_4 SG_t + \varepsilon_t \quad (3)$$

where total accruals (*TAccr*) is the difference between earnings before extraordinary items and cash flows from operations reported in the statement of cash flows, *ΔSales* is change in sales, *ΔREC* is the change in accounts receivable and *PPE* is gross property, plant and equipment. All the variables, including the intercept are scaled by total assets at the end of year *t-1*. We also include an unscaled intercept in all our regressions. To control for the influence of firm performance and growth, we follow the recommendations of Kothari et al. [2005] and Collins et al. [2012] and also include as additional regressors lagged *ROA* (defined as net income scaled by total assets) and current growth in sales (*SG*). These controls for performance and growth are included in the estimation of all our proxies for earnings management. Model (3) is estimated for each 2-digit SIC industry-fiscal year grouping, imposing a minimum of 15 observations per regression. The residuals of this model are our first proxy for discretionary accruals, which we denote as *DA_Modified Jones*. In the robustness tests section, we discuss the results when we

employ an alternative approach to control for performance and growth in which we match treatment firms with firms of a control sample on *ROA* and *SG*.

Second, we calculate discretionary accruals using the lagged model developed by Dechow et al. [2003], using the following regression:

$$TAccr_t / Assets_{t-1} = \alpha + \beta_0 \, 1/Assets_{t-1} + \beta_1 \, ((1+k) \, \Delta Sales_t - \Delta REC_{it}) / Assets_{t-1} + \beta_2 \, PPE_t/Assets_{t-1} + \beta_3 \, Total \, Accr_{t-1} + \beta_4 \, ROA_{t-1} + \beta_5 \, SG_t + \varepsilon_t \quad (4)$$

where k is the slope coefficient from a regression of ΔREC on $\Delta Sales$ for each two-digit SIC-year grouping and captures the expected change in accounts receivable for a given change in sales. The rest of variables and controls are as above. The residuals of this model are our second proxy for discretionary accruals, which we denote as *DA_Lagged Model*.

Finally, we estimate discretionary accruals from the "adapted model," proposed in Dechow et al. [2003], using the following regression:

$$TAccr_t / Assets_{t-1} = \alpha + \beta_0 \, 1/Assets_{t-1} + \beta_1 \, ((1+k) \, \Delta Sales_t - \Delta REC_{it}) / Assets_{t-1} + \beta_2 \, PPE_t/Assets_{t-1} + \beta_3 \, ROA_{t-1} + \beta_4 \, SG_t + \varepsilon_t \quad (5)$$

where all variables and procedures are as previously defined. The residuals of this model are our third proxy for discretionary accruals, which we denote as *DA_Adapted Model*.

3.1.2. Real earnings management proxies

To measure real earnings management, we use a combination of two proxies proposed by Roychowdhury [2006]: abnormal production costs and abnormal discretionary expenses. Following Roychowdhury, production costs are modeled as a linear function of contemporaneous sales and of contemporaneous and lagged changes in sales. To estimate this

model, we run the following cross-sectional regression for each two-digit SIC industry/fiscal year grouping imposing a minimum of 15 observations per regression:

$$PROD_t / Assets_{t-1} = \alpha + \beta_0\, 1/Assets_{t-1} + \beta_1\, Sales_t / Assets_{t-1} + \beta_2\, \Delta Sales_t / Assets_{t-1} + \beta_3\, \Delta Sales_{t-1} / Assets_{t-1} + \beta_4\, ROA_{t-1} + \beta_5\, SG_t + \varepsilon_t \quad (6)$$

Production costs (*PROD*) are defined as the sum of costs of goods sold and the change in inventory during the year. The other regressors have already been defined. The residuals from model (6) are our estimate of abnormal production costs (*APROD*). More positive values of *APROD* are associated with more income increasing real earnings management.

Our second proxy for real earnings managements is abnormal discretionary expenses. The normal level of discretionary expenses can be expressed as a linear function of lagged sales using the following model for each industry-fiscal year grouping:

$$DEXP_t / Assets_{t-1} = \alpha + \beta_0\, 1/Assets_{t-1} + \beta_1\, Sales_t / Assets_{t-1} + \beta_4\, ROA_{t-1} + \beta_5\, SG_t + \varepsilon_t \quad (7)$$

Discretionary expenses (*DEXP*) are defined as the sum of SG&A, R&D and advertising expenses. The residuals of this model are our estimate of abnormal discretionary expenses (*AEXP*). More negative values of *AEX*P are associated with more income increasing real earnings management.

Finally, we follow Cohen and Zarowin [2010] and Zang [2012] and aggregate the two measures into one proxy (*RM*), by adding *APROD* and -1**AEXP*. Higher values of *RM* are interpreted as evidence of more income-increasing real earnings management.[3]

[3] We do not examine abnormal cash flows from operations because real activities manipulation impacts this variable in different directions and the net effect is ambiguous, as discussed by Roychowdhury [2006).

3.2. MEASUREMENT OF ACCOUNTING CONSERVATISM

We employ a summary measure of conservatism constructed with three firm-year proxies for conservatism: (1) the Khan and Watts [2009] measure based on the Basu [1997] model, (2) the Givoly and Hayn [2000] measure based on the skewness of earnings, and (3) the Callen et al. [2010] measure based on the Vuolteenaho [2002] return decomposition model.[4]

Our first measure is based on the conservatism scores developed by Khan and Watts [2009]. Drawing from the Basu [1997] model, they estimate the timeliness of earnings to good news (*G_Score*) and the incremental timeliness of earnings to bad news (*C_Score*). By adding both, we obtain the total timeliness of bad news recognition.[5] We define our first conservatism proxy as the three-year average of the total timeliness of loss recognition (*G_Score* + *C_Score*), and denote this measure as *CO_TLR*. We take the three-year average to reduce measurement error and better capture firms' conservative reporting choices. Following Khan and Watts, to estimate this measure we delete firm-years with price per share less than $1, with negative total assets or book value of equity, and firms in the top and bottom 1% of earnings, returns, size, market-to-book ratio, leverage and depreciation each year. While there is some controversy about the validity of firm specific measures of conservatism derived from the Basu [1997]

[4] Prior literature has also used another firm-year specific measure of conservatism: the accumulation of non-operating accruals (Givoly and Hayn [2000]. We do not use this proxy because our dependent variables are discretionary accruals, which are mechanically associated with non-operating accruals.

[5] Taking the Basu [1997] model (Earn = $\beta_0 + \beta_1$ Neg + β_2 Ret + β_3 Ret*Neg + ε) as a reference, G_Score is a firm-year estimation of the β_2 coefficient (the timeliness to good news) and C_Score is the estimation of the β_3 coefficient (the incremental timeliness to bad news). Therefore, G_Score + C_Score is the total timeliness to bad news.

model,[6] Ettredge et al. [2012] show that the Khan and Watts [2009] measure captures properly expected variations in conservatism.

The second conservatism measure is based on the work of Givoly and Hayn [2000]. It is the negative of the ratio of the skewness of net income to the skewness of cash flow from operations, as in Zhang [2008]. To obtain the skewness we use rolling windows of five years ending at the current year. We denote this measure as *CO_SKW*.

Our third measure is based on the ratio developed by Callen et al. (2010), which is based on the Vuolteenaho [2002] return decomposition model. Their conservatism ratio captures the proportion of the total shock to current and expected future earnings recognized in current year earnings. As with the previous measures, to better capture firms' conservative decisions we take the three-year average, and denote it as *CO_CR*. To compute *CO_CR*, we follow the estimation details described in Callen et al. [2010].[7] These authors estimate a pooled regression per industry across time using all sample years available. This can cause a look-ahead bias in the estimates of *CO_CR* because the measure for, say, 1995 uses future information from 1996 onwards. To avoid the potential negative effects of the look-ahead bias, we use a 25-year rolling window approach ending in the current year of each *CO_CR* measure. That is, to estimate *CO_CR* for, say, 1995, our pooled regressions across time include years 1971-1995, and we take the estimates of *CO_CR* for the last year. Since conservatism is likely to be manifested when news is bad, following Callen et al., we restrict the sample to observations with negative unexpected returns and we drop observations with negative *CO_CR* as its interpretation is ambiguous.

---

[6] Dietrich et al. [2007], Givoly et al. [2007] and Patatoukas and Thomas [2011] claim that the Basu [1997] asymmetric timeliness coefficient is not a valid measure of conditional conservatism, while Ball et al. [2013a, 2013b] and Ettredge et al. [2012] provide evidence on the contrary.

[7] The computer code to estimate this proxy can be found in Callen and Segal [2010].

Finally, we combine our three proxies into a summary measure of conservatism. To do so, we take the average of the three standardized conservatism proxies.[8] If one of the proxies is not available we use the average of the other two. If two are missing, then we use the remaining one.[9] To mitigate measurement error in our measure and to reduce concerns about possible non-linearities, we take annual deciles of the average and denote this summary measure as *CO*.

3.3. CONTROL VARIABLES FOR THE INNATE DETERMINANTS OF CONSERVATISM AND INCENTIVES FOR EARNINGS MANAGEMENT

Conservatism is jointly determined by innate firm characteristics and by managerial discretionary choices. Therefore, in models (1) and (2) we control for the innate determinants of conservatism (*InnateDet_CO*). Controlling for these determinants ensures that our conservatism measure is not just a proxy for the innate determinants. This approach follows the method in Francis et al. [2005]. The selection of innate determinants is based on previous literature (e.g., Watts [2003]; Qiang [2007]; LaFond and Watts [2008]) that identifies contracting, litigation, taxation, political costs and information asymmetry as the main drivers of conservatism in accounting. We include *Leverage* to capture debt contracting motivations, defined as short-term plus long-term debt scaled by market value of equity. The year indicator variables included in the regression control for periods of high auditor litigation (Basu [1997]; Holthausen and Watts [2001]) and the passage of the Sarbanes-Oxley Act. Taxation incentives for conservatism are captured by a dummy variable (*Low MTR*) that takes the value of one if the firm has a low

[8] We use unit weights to construct *CO* following the recommendations of Grice and Harris [1998], who find that unit-weighted composites exhibit better psychometric properties than alternative weighting schemes. We obtain similar results if we use factor analysis.

[9] This research design choice to maximize the sample size does not introduce bias because when we run our tests for each conservatism proxy separately we obtain the same inferences.

marginal tax rate, and zero otherwise. A low marginal tax rate is assumed if the firm's marginal tax rate is below the statutory tax rate. To measure the marginal tax rate we employ the proxy developed by Blouin et al. [2010]. Size is used to capture political pressures and it is measured as the natural log of market value of equity. As in LaFond and Watts [2008], the demand for conservatism driven by information asymmetries is captured by the Bid/Ask spread. Finally, we also include the market-to-book ratio (MTB) because firms with high MTB ratio have more growth options relative to assets in place; growth options are associated with agency costs and conservatism is an efficient governance response to these agency costs (Khan and Watts [2009]).

We also control for the determinants (costs, opportunities) of engaging in either accruals or real earnings management (*TradeOff_RMvsAM*). To do so, we follow the approach in Zang [2012]. Similar to Cohen et al. [2008] and Cohen and Zarowin [2010], Zang formally models the trade-offs faced by firms when selecting the type of manipulation. She also asserts that there is a certain sequence when choosing between both types of manipulations, and proposes two key ideas when considering the trade-offs between earnings management types. First, engaging in earnings management is costly for firms and they must trade-off between manipulating real activities or accruals. The decision is based on their relative costliness and firms' ability to do one type or the other. Second, the decision to engage in real earnings management is taken early in the year and the effects are realized during the year. At the end of the year, managers still can further adjust earnings by engaging in accruals earnings management. For this reason, it is important to consider the timing of both activities when designing the tests.

Zang [2012] shows that the level of each earnings management activity decreases with its own costs and increases with the costs of the other. She demonstrates that firms prefer different earnings management strategies in a predictable manner, depending on their operational and

accounting environment. Following Zang, we introduce in equations (1a) and (1b) the following determinants of the decision to engage in either accrual-based or real earnings management: a) corporate governance (institutional investors, analysts following and the anti-takeover index of Cremers and Nair [2005]), b) market share (% of firm sales over total sales in the industry), c) firm financial condition (Z-Score, Altman [1968]), d) taxation (the marginal tax rate), e) auditing (indicator variable for strong auditing), f) past earnings management (the bloated balance sheet measure in Barton and Simko [2002]), g) length of the operating cycle (in days), h) pre-managed earnings (earnings before extraordinary items minus discretionary accruals), i) effect of real earnings management on accruals management (the fitted and the residuals of the real earnings management equation), and j) firm performance (ROA and sales growth). We explain the rationale for including each of these variables and how they are constructed in Appendix A.

4. Sample and results

We use COMPUSTAT to extract accounting data and CRSP to extract stock market data. Analyst data come from IBES, ownership data from Thomson Financial, and governance data from Risk Metrics. Our final sample contains 38,968 firm-year observations and spans 20 years, t = 1991 to 2010. The sample period begins in 1991 because it is the first year in which some of the governance variables are available. We eliminate financial firms (SIC 6000–6999) and winsorize all continuous variables at the top and bottom percentiles to avoid the effect of outliers. Table 1 reports descriptive evidence of the data used to run the main regression tests. Panel A shows summary statistics of the main variables of interest and Panel B shows the correlation matrix. The descriptive evidence presented in Table 1 is generally consistent with prior evidence. The discretionary accruals proxies (*DA_*) are on average close to zero, as expected, and are

negatively associated with prior earnings management as measured by balance sheet bloat (*NOA*), indicating that the balance sheet acts as a constraint for further accruals-manipulation, consistent with the arguments in Barton and Simko [2002]. In contrast, *NOA* is positively correlated with *RM*, consistent with the existence of a certain level of displacement from one type of earnings management to the other. It is interesting to note however that the accrual-based and real earnings management proxies are positively correlated, indicating that, on aggregate, firms tend to combine both types of manipulation, rather than substitute one for another.

4.1. DISCUSSION OF MAIN RESULTS

Table 2 presents the results from running models (1a) and (1b). Following Petersen [2009], we estimate this regression in a pooled fashion and report *p*-values based on standard errors that are robust to heteroskedasticity, serial and cross-sectional correlation with a two dimensional cluster at the firm- and year-level. The evidence reported in Table 2 supports our predictions: conservatism is associated with lower accrual-based earnings management. Specifically, we find that conservatism is related to lower discretionary accruals, as measured by our *DA_Modified* (*CO* = -0.473, *p*-val < 0.01), *DA_Lagged* (*CO* = -0.262, *p*-val < 0.01), and *DA_Adapted* (*CO* = -0.473, *p*-val < 0.01) proxies. Overall, this evidence is consistent with the arguments in Watts [2003] and LaFond and Watts [2008] that conservatism in accounting reduces earnings management.

Regarding the association between conservatism and real earnings management, we find evidence consistent with the existence of potential preferences and trade-offs in choosing earnings management instruments. When we use our proxy for real earnings management as the dependent variable in model (1), the coefficient on *CO* is significantly positive (*CO* = 0.768, *p*-

val < 0.01), indicating that the disciplining role of conservatism prevents accruals-based (purely accounting) manipulation, leading managers to resort to real actions. This positive association between conservatism and real earnings management is consistent with the evidence in Demski [2004] and Ewert and Wagenhofer [2005] that introducing constraints to accruals-based earnings management leads to greater real earnings management. In terms of economic significance, a five-decile change in *CO* (i.e., moving from the first to the third quartile) results in a reduction in accruals (as per the modified Jones model) of -2.37% and in an increase in *RM* of 3.84%.

In line with the existence of patterns in the data that suggest that there is a certain substitution between the two types of manipulation, we find that *NOA* (our proxy for past accumulated accruals-manipulation) is negatively associated with accruals earnings management across all models, while it is positively associated with real earnings management (model 1, NOA (t-1) = 6.429, *p*-val < 0.01). This is consistent with firms switching from accruals- to real earnings management when they exhaust the possibilities for further accruals manipulation. Overall, the evidence suggests that conservatism reduces accrual-based earnings management and this creates a substitution effect that triggers an increase in real earnings management.

Regarding the rest of control variables, our results are in line with Zang [2012]. Corporate governance provisions (*Institutions*, *Analysts* and the anti-takeover index *ATI*), financial health (*Z-Score*) and the length of the operating cycle (*Cycle*) show a negative and significant association with earnings management through real operations, while *Market share*, a low marginal tax rate (*Low MTR*), and strong auditing (*Auditing*) show the opposite effect.

In our second set of analyses, we study the overall effect of conservatism on earnings management (considering both types together). To do so, we focus on firms that are classified as either being suspect or non-suspect of managing earnings. Suspect firms are firms with a high

probability of having engaged in earnings management because they narrowly beat or meet important earnings benchmarks. A total of 6,193 firm-year observations are classified as suspect firms. Non-suspect firms are those firms with low probability of having engaged in earnings management. There are 9,229 non-suspect firm-year observations. Using this sample of 15,422 firm-year observations, we run a logit model (2) to assess the probability that firms are classified as suspect or non-suspect, conditional on their level of conservatism. In this model, the dependent variable equals one if the firm is suspect and zero if the firm is non-suspect. Table 3 reports results from running this test. The evidence indicates that, overall, conservatism reduces the likelihood of being a suspect firm (*CO* = -0.019, *p*-val = 0.01). This suggests that even if a certain level of substitution between accruals-based and real earnings management appears to take place, conservatism is an efficient corporate governance mechanism that, overall, leads to a reduction in the probability that a firm reports manipulated financial statements (using either method.) In terms of economic significance, a five-decile change in *CO* (i.e., moving from the first to the third quartile) results in a reduction in the probability of being a suspect of 2.5%.

4.2. ROBUSTNESS CHECKS AND ADDITIONAL ANALYSES

To check the robustness of our findings, we carry out a number of sensitivity analyses. First, we repeat our main analysis in Table 2 (models 1a and 1b) restricting the test to those firms that are classified as either being suspect or non-suspect. These tests should provide a starker contrast of our hypotheses because here we only include firms with a high or low probability of having engaged in earnings management. Table 4 provides the results for this analysis. All results are consistent with the previously reported evidence. We find that conservatism is negatively associated with accruals-based earnings management (*DA_Modified*, *CO* = -0.472, *p*-val <0.01; *DA_Lagged*, *CO* = -0.276, *p*-val <0.01; *DA_Adapted*, *CO* = -0.472, *p*-val <0.01), but also, we

provide evidence of a substitution effect between the two types of manipulation, as we find a positive relation between conservatism and real earnings management (CO = 0.808, p-val <0.01).

We repeat the analysis of Table 4 focusing only on suspect firms. Because we focus on a very specific subset of firms, we could be incurring in a selection bias. To address this issue, we employ a two-stage Heckman [1979] procedure. In the first stage, we run a probit model with all available firms with enough data to predict the likelihood of being suspect. The explanatory variables are taken from Cohen and Zarowin [2010] and Zang [2012] and include controls for a) whether a firm is an habitual beater, measured as the number of times the firm beats/meets analysts' forecast consensus in the past four quarters,[10] b) Stock issue (t+1): an indicator variable that equals one if the firm issues equity in the next fiscal year, and zero otherwise, c) Analysts: the number of analysts following the firm, d) MTB: the market to book ratio, e) Size: the log of the market value of equity, f) Leverage: short-term plus long-term debt scaled by market value of equity, g) Shares: the log of the number of shares outstanding, and h) ROA3: return on assets computed using net income for the rolling four quarters ending with the third quarter of year t.

Table 5 Panel A provides summary statistics of the above variables, and Table 5 Panel B reports the results of the first-stage Heckman procedure. The main results are presented in Table 5 Panel C, which provides evidence of the second-stage Heckman regression that includes the inverse mills ratio (IMR) estimated with data from the first-stage regression to control for a possible selection bias. The results confirm all the previous findings. We report evidence

[10] Firms for which there are no data to compute habitual beaters are assigned a value of zero. This could introduce errors because some of these firms could be habitual beaters but we failed to identify them correctly. To control for this possibility, we include in the model an indicator variable (Habitual beater dummy) that equals one if Habitual beater is missing, and zero otherwise.

consistent with conservatism reducing accruals-based earnings management, but also, potentially increasing real earnings management.

As a further robustness test, we control for the effects of performance and growth in accruals using the performance matching technique advocated by Roychowdhury [2006] and Collins et al. [2012]. To implement this performance matching technique, the residuals from all our earnings management models are adjusted for like residuals from firms matched on ROA and sales growth (SG). To do so, we first split the sample into two subsamples: the treatment sample that contains the suspect firms and a control subsample that consists of non-suspect firms. Next, we arrange all same-industry treatment firms each fiscal year into five ROA_{t-1} quintiles and choose the matching control firm that has the closest SG in the relevant quintile, year, and industry (two-digit SIC). We apply this procedure to all the proxies for earnings management used in the paper. Table 6 presents the results using performance-matched earnings management proxies. The results are identical even though the sample size is substantially reduced because it is difficult to always find a matching firm.

As a final robustness test, we run all the previously reported tests using our three conservatism proxies separately. This procedure generates identical inferences.

4.3. ASSESSMENT OF THE CONSTRUCT VALIDITY OF THE CONSERVATISM PROXY (*CO*)

As previously mentioned, the controversy surrounding the association between conservatism and earnings management can be partly explained by the different underlying definitions of conservatism used in the prior literature. Despite the extant empirical work in this area, much confusion still exists, particularly in practice and amongst regulators, surrounding the differences

and interrelations between conditional and unconditional conservatism, which in the extreme can sometimes be confused with opportunistic income-decreasing practices and bath accounting. Given this and the controversy over the use of firm-year specific conservatism measures, we carry out a series of tests to assess the construct validity of *CO*. Similar to Khan and Watts [2009], we examine whether the empirical properties of *CO* are consistent with predictions of conservatism and with associations documented in the prior literature using other conservatism measures. We begin by placing firms into *CO* deciles each year. Then, we compute the mean of the different properties associated with conservatism for each decile, and verify whether the mean values vary monotonically as we move along the *CO* deciles. If this is the case for most of the properties examined, we can conclude that *CO* is associated with the underlying unobserved level of conservatism. Examining the properties of *CO* deciles allows non-parametric tests of unconditional (univariate) predictions, and avoids issues of potential non-linearities in the relations examined. As shown in Table 7, we find that the decile-average firm size, ROA, market-to-book ratio and age increases monotonically as we move from the most to the least conservative decile according to *CO*, while we find the opposite effect for leverage, the length of the operating cycle, volatility and proxies for information asymmetries (the bid-ask spread and the PIN score). We also find that the rank correlation between the *CO* deciles and the deciles of each of the individual conservatism proxies (*CO_TLR*, *CO_SKW* and *CO_CR*) is 1. Overall, these results are consistent with *CO* being a robust firm-year measure of conservatism.

5. Summary and conclusions

Watts [2003] and LaFond and Watts [2008], among others, argue that the asymmetric recognition of good and bad news in earnings leads to lower earnings management. In line with the

analytical evidence of Chen et al. [2007], we argue that conservatism imposes additional costs to managing earnings, thereby reducing the expected benefits of the manipulation, and, thus, constraining earnings management practices in more conservative firms. Our empirical results support this argument. However, to the extent that managers find it more costly to manage accruals and the incentives for earnings management remain relatively constant, we expect that they may shift to real earnings management practices, which they may, in fact, prefer (Graham et al. [2005]. Our results are consistent with conservatism encouraging this substitution between accruals and real earnings management.

This switch between accruals and real earnings management raises the issue of what is the net effect of conservatism and whether its benefits may not be outweighed by its costs. To gauge the net effect, we analyze whether conservatism decreases the overall probability that a firm manipulates its financial statements (by using either method). We provide evidence that more conservative firms have lower probability of having engaged in earnings management of any type to achieve earnings benchmarks. This indicates that, in terms of the aggregate level of earnings management, the displacement from one type of manipulation to the other is moderate and overall, conservatism serves to constrain earnings manipulation.

Our empirical results provide support to the common untested assumption that conservatism reduces earnings management (Watts [2003]; Guay and Verrecchia [2006]; LaFond and Watts [2008]), and contribute to the literature on the trade-offs between accounting and real earnings management (Cohen et al. [2008]; Cohen and Zarowin [2010]; Zang [2012]). Although conservatism triggers the documented trade-off between the two types of earnings management, the overall effect of conservatism is beneficial as it reduces the overall likelihood of engaging in any type of earnings management to meet or beat earnings benchmarks. We thus add to a large

stream of recent literature on the benefits of conservatism for the different parties with an interest in the firm. We also add to the concerns already voiced in this literature about the possible negative effects of the regulatory changes introduced by the FASB and the IASB through their joint conceptual framework, which favors neutral instead of conservative reporting.

Appendix A

Determinants of the decision to choose accrual-based vs real earnings management

(a) *Corporate Governance:* Firms that are closely monitored may find it more costly to manipulate real activities as these manipulations have real costs for investors. On the other hand, accruals manipulations might be seen as a benign form of achieving earnings targets that do not affect the underlying economics of the firm and can even be used to convey information to the market about future profitability (Healy and Wahlen [1999]). For instance, institutional investors, being more sophisticated and better informed are likely to exert a higher effort in monitoring operational decisions that can have long-term economic implications (Bushee [1998]; Roychowdhury [2006]), and they are less likely to pay excessive attention to accruals manipulations, particularly if they are within reasonable boundaries. We use three proxies for governance, all measured at the beginning of the fiscal year: the proportion of institutional investors (*Institutions*), the number of analysts following (*Analysts*), and the alternative takeover vulnerability index (*ATI*) developed by Cremers and Nair [2005]). This index is based on the one developed by Gompers et al. (2003). It focuses on only three key antitakeover provisions shown to be critical to takeovers.[11] These three provisions are the existence of classified boards, of blank check preferred stock ("poison pill"), and of restrictions on shareholders on calling special meetings or acting through written consent. We assign the index an initial value of 4 and remove a point for the existence of each of these three provisions to create a value between 1 and 4, where a higher value implies less protection against takeovers and hence higher quality of external governance. Because the data to construct the index is only available for 40 percent of observations, following Biddle et al. [2009]), we set observations with missing *ATI* to zero. We then include an indicator variable (*ATI_dummy*) that takes the value of one if the data is missing and zero otherwise. In summary, we expect that the three governance proxies will have a negative association with real earnings management and a positive association with accruals earnings management.

(b) *Market Share:* Firms that are leaders in their own industries and exert certain dominance in the markets they operate in have more room to deviate from optimal operational policies than firms that operate in competitive industries. For this reason we expect to observe that firms with a high market share are more likely to engage in real earnings management than firms that are followers. To capture this effect, we define *Market share* as the percentage of the company's sales to total sales of its 3-digit SIC industry, measured at the beginning of the year.

(c) *Financial condition*: Firms in poor financial condition, especially those approaching bankruptcy, are expected to do everything possible to improve their situation and restore financial health. This is likely to imply the adoption of radical operating decisions to reduce losses and improve future prospects. Nini et al. [2012]) show that firms that

[11] We do not use the Gompers et al. [2003] index because a few data items necessary to construct it are not available since 2007. We appreciate the assistance of Martijn Cremers in the construction of ATI.

violate debt covenants, a clear sign of financial distress, immediately experience sharp declines in acquisitions and capital expenditures. In these situations, the use of accruals management is not the appropriate strategy because it is not going to alter the underlying economics of the firm. To control for the firm's financial condition, we use Altman's [1968] bankruptcy *Z-Score* measured at the beginning of the year. Because higher values of *Z-Score* indicate better financial health, we expect to observe a negative (positive) association between real (accrual) earnings management and *Z-Score*.

(d) *Taxation:* Real manipulations are likely to have a direct impact in the firm's taxable income because they tend to have real cash flow implications, whereas accrual manipulations usually do not affect taxable income. For example, reducing R&D expenditures increases taxable income, whereas increasing bad debt expense does not. We measure tax incentives for earnings management with an indicator variable (*Low MTR*) that takes the value of one if the firm has a low marginal tax rate. Firms with low marginal tax rates are expected to engage in more real earnings management and less accruals earnings management. Taxation was already included in the model as it is also a driver of conservatism (Watts [2003]).

(e) *Auditing*: We expect that high quality auditors are more likely to detect and disallow aggressive accrual-based earnings management activities. On the other hand, auditors are not expected to curtail real operating decisions because is not part of their responsibilities. To measure the quality of the firm's auditor, we employ an indicator variable (*Auditing*) that equals one if the firm has a Big-8 auditor and the auditor tenure is above the sample mean, and zero otherwise.[12] We expect to observe a negative (positive) association between accruals (real) earnings management and *Auditing*.

(f) *Past accruals-based earnings management*: Past accruals-based earning management is likely to have an influence in current and future accruals management because of the articulation between the income statement and the balance sheet, and because of the limitations imposed by GAAP. Therefore, if a firm has been aggressive in managing accruals in the past, in the future it will have little or no room for additional accruals management. To capture this effect we use the measure of balance sheet bloat developed by Barton and Simko [2002]. *NOA* is an indicator variable that equals one if the net operating assets (i.e., shareholders' equity less cash and marketable securities and plus total debt) at the beginning of the year divided by lagged sales is above the median of the corresponding two-digit SIC industry-year, and zero otherwise. To the extent that managers exhaust the possibility of managing accruals, they are expected to resort to manage real activities. We expect to observe a negative (positive) association between accruals (real) earnings management and *NOA*.

(g) *Length of the operating cycle*: The longer the cycle, the greater the possibilities to manage accruals and the lesser the need to resort to managing real activities. To capture

---

[12] Prior research has documented that top auditors are successful in constraining accruals earnings management (DeFond and Jiambalvo [1993]; Francis et al. [1999]) and that auditing quality increases with auditor tenure (Stice [1991]). We do not use a dummy variable indicating whether the firm has a Big-8 auditor because most of the firms in our sample fall in this group and this results in very little cross-sectional variation in the variable.

this effect, we use the length of the operating cycle (*Cycle*) computed as the days of receivables plus the days of inventories less the days of payables, all at the beginning of the year. We predict a positive (negative) association between accruals (real) earnings management and *Cycle*.

(h) *Pre-managed earnings*: As argued in Zang [2012], managers must make the decision to engage in real earnings management early in the year because these activities take time to deliver the expected results. When making the decision they observe the result of similar activities in the previous year before including the effect of accruals management, which is decided at year closing. To capture this effect, we define pre-managed earnings (*Earn*) as earnings before extraordinary items minus discretionary accruals from the modified Jones model, both measured at t-1, and include *Earn* in the equation in which real earnings management is the dependent variable (model 1.a).

(i) *Effect of real earnings management on accruals-based earnings management*: Because of the sequential nature of the decisions to engage in earnings management (the decision to manipulate real activities must be taken early in the year), in the equations where the dependent variable is discretionary accruals (model 1.b), we include as explanatory variables the fitted values and the residuals of the real earnings management equation. We denote these variables as *Predicted RM* and *Unexpected RM*, respectively.

(j) *Firm Performance*: Finally, we also include two controls for firm performance. Return on assets (*ROA3*), computed using net income for the rolling four quarters ending with the third quarter of year t, and sales growth (*SG*), which equals the change in annual sales scaled by previous year's sales.

Appendix B

Variables description

RM	Real earnings management proxy computed as the addition of APROD and -1*AEXP, which are Roychowdhury's [2006] abnormal production costs and abnormal discretionary expenses, respectively.
DA_Modified Jones	Discretionary accruals (DACC) obtained with the modified Jones model.
DA_Lagged Model	DACC obtained with the lagged model in Dechow et al [2003].
DA_Adapted Model	D obtained with the adapted model in Dechow et al [2003].
CO	Summary measure of conditional conservatism obtained as the decile-ranks of the average of the following three standardized proxies for conservatism: CO_TLR which is the three-year average of timeliness loss recognition (G_Score + C_Score). G_Score is the timeliness of earnings to good news and C_Score is the incremental timeliness of earnings to bad news as developed by Khan and Watts [2009]. CO_SKW is the negative of the ratio of the skewness of net income to the skewness of cash flow from operations. To obtain the skewness, we use rolling windows of five years ending at the current year. CO_CR is the three-year average of the conservatism ratio as developed by Callen et al. [2010].
Institutions (t-1)	is the percentage of firm shares held by institutional investors, at the start of the year.
Analysts (t-1)	is the number of analysts following the firm, at the start of the year.
ATI (t-1)	is the alternative takeover vulnerability index developed by Cremers and Nair [2005]. It ranges from 1 to 4. If ATI is missing, we assign it a value of zero. It is measured at the start of the year.
ATI_dummy	is an indicator variable that equals one if ATI is not available and zero otherwise.
Maket share (t-1)	is the percentage of the company's sales to total sales of its 3-digit SIC industry, measured at the beginning of the year.
Z-Score (t-1)	is Altman's [1968] bankruptcy score measure at the beginning of the year. It equals 3.3*Net income + Sales + 1.4*Retained earnings + 1.2*Working capital + 0.6*Market value of equity, with all variables scaled by total assets except Market value of equity which is scaled by total liabilities.
Low_MTR	is an indicator variable that takes the value of one if the firm has a low marginal tax rate, and zero otherwise. A low marginal tax rate is assumed if the firm's marginal tax rate is below the statutory tax rate. To measure the marginal tax rate we employ the proxy developed by Blouin et al. [2010].

Auditing	is an indicator variable that equals one if the firm has a Top-8 auditor and the auditor tenure is above the sample mean, and zero otherwise.
NOA (t-1)	is an indicator variable that equals one if the net operating assets (i.e., shareholders' equity less cash and marketable securities and plus total debt) at the beginning of the year divided by lagged sales is above the median of the corresponding two-digit SIC industry-year, and zero otherwise.
Cycle (t-1)	is the days of receivables plus the days of inventories less the days of payables, all at the beginning of the year.
ROA3	is return on assets computed using net income for the rolling four quarters ending with the third quarter of year t.
SG	equals the change in annual sales scaled by previous year's sales.
MTB	is the market-to-book value of equity ratio.
Size	is the log of market value of equity.
Leverage	equals short-term plus long-term debt scaled by market value of equity.
Bid/Ask spread	is the annual average of daily spread scaled by the midpoint between bid and ask.
Earn (t-1)	is earnings before extraordinary items minus discretionary accruals from the modified Jones model, both measured at t-1.
Suspect	is an indicator variable that equals one if the firm is suspect of engaging in earnings management, and zero if the firm is non-suspect. Suspect firms are either a) firm-years with earnings before extraordinary items over lagged assets between 0 and 0.005; or b) firm-years with change in basic EPS excluding extraordinary items from last year between zero and two cents; or c) firm-years with actual EPS exceeding by up to one cent the last analyst forecast consensus before the fiscal year end. Non-suspect firms are a) firm-years that miss or beat the zero earnings benchmark by more than 2.5% of lagged total assets; b) firm-years that miss or beat last-year EPS by more than five cents; and c) firm-years that miss or beat analyst forecast consensus by more than 5 cents.
Pred_RM	is the fitted values of the estimation of model (1.a).
Unexp_RM	is the residual values of the estimation of model (1.a).
Habitual beater	is the number of times the firm beats/meets analysts' forecast consensus in the past four quarters. Firms for which there are no data to compute Habitual beaters are assigned a value of zero.
Habitual beater_dum	is an indicator variable that equals one if Habitual beater was missing, and zero otherwise.
Stock issue (t+1)	is an indicator variable that equals one if the firm issues equity in the next fiscal year, and zero otherwise.
Shares	is the log of the number of shares outstanding.

References

AHMED, A.S., B.K. BILLINGS, R.M. MORTON AND M. STANFORD-HARRIS. "The role of accounting conservatism in mitigating bondholder-shareholder conflicts over dividend policy and in reducing debt costs." *The Accounting Review* 77 (2002): 867-890.

AHMED, A.S. AND S. DUELLMAN. "Evidence on the role of accounting conservatism in corporate governance." *Journal of Accounting and Economics* 43 (2007): 411-437.

ALTMAN, E. "Discriminant analysis and the prediction of corporate bankruptcy." *The Journal of Finance* 23 (1968): 589-609.

BADERTSCHER, B. "Overvaluation and the choice of alternative earnings management mechanisms." *The Accounting Review* 86 (2011): 1491–1518.

BALL, R., S.P. KOTHARI AND V.A. NIKOLAEV. "Econometrics of the Basu asymmetric timeliness coefficient and accounting conservatism." *Journal of Accounting Research* 51 (2013a): 1071-1097.

BALL, R., S.P. KOTHARI AND V.A. NIKOLAEV. "On estimating conditional conservatism." *The Accounting Review* 88 (2013b): 755-787.

BARTON, J., AND P.J. SIMKO. "The balance sheet as an earnings management constraint." The Accounting Review 77 (2002): 1-27.

BARTOV, E., D. GIVOLY AND C. HAYN. "The rewards to meeting or beating earnings expectations." *Journal of Accounting and Economics* 33 (2002): 173-204.

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

BEAVER, W.H. AND S.G. RYAN. "Conditional and unconditional conservatism: Concepts and modeling." *Review of Accounting Studies* 10 (2005): 269-309.

BEEKES, W., P.F. POPE AND S. YOUNG. "The link between earnings timeliness, earnings conservatism and board composition: evidence from the UK." *Corporate Governance* 12 (2004): 47-51.

BEYER, A. "Conservatism and aggregation: The effect on cost of equity capital and the efficiency of debt contracts." Working paper, Stanford University. Available at SSRN: http://ssrn.com/abstract=2028159

BHOJRAJ, S., P. HRIBAR, M. PICCONI AND J. MCINNIS. "Making sense of cents: An examination of firms that marginally miss or beat analyst forecasts." *The Journal of Finance* 64 (2009): 2361-2388.

BIDDLE, G.C, G. HILARY AND R.S. VERDI. "How does financial reporting quality improve investment efficiency?" *Journal of Accounting and Economics* 48 (2009): 112-131.

BLOUIN, J., J. CORE AND W. GUAY. "Have the tax benefits of debt been overestimated?" *Journal of Financial Economics* 98 (2010): 195-213.

BURGSTAHLER, D., AND I. DICHEV. "Earnings management to avoid earnings decreases and losses." *Journal of Accounting and Economics* 24 (1997): 99-126.

BUSHEE, B. "The influence of institutional investors on myopic R&D investment behavior." *The Accounting Review* 73 (1998): 305–333.

CALLEN, J.L., AND D. SEGAL. "A Variance Decomposition Primer for Accounting Research." *Journal of Accounting, Auditing & Finance* 25 (2010): 121–142.

CALLEN, J.L., D. SEGAL, AND O-K. HOPE. "The pricing of conservative accounting and the measurement of conservatism at the firm-year level." *Review of Accounting Studies* 15 (2010): 145–178.

CHEN, Q., T. HEMMER AND Y. ZHANG. "On the relation between conservatism in accounting standards and incentives for earnings management." *Journal of Accounting Research* 45 (2007): 541-565.

COHEN, D.A., A. DEY AND T.Z. LYS. "Real and accrual-based earnings management in the pre- and post-Sarbanes-Oxley periods." *The Accounting Review* 83 (2008): 757-787.

COHEN, D.A. AND P. ZAROWIN. "Accrual-based and real earnings management activities around seasoned equity offerings." *Journal of Accounting and Economics* 50 (2010): 2-19.

COLLINS, D.W., R.S. PUNGALIYA, AND A.M. VIJH. "The effects of firm growth and model specification choices on tests of earnings management." Available at SSRN: http://ssrn.com/abstract=1823835.

CREMERS, K. J. M., AND V.B. NAIR. "Governance mechanisms and equity prices." *The Journal of Finance* 60 (2005): 2859–2894.

DECHOW, P. M., S.A. RICHARDSON AND I. TUNA. "Why are earnings kinky? An examination of the earnings management explanation." *Review of Accounting Studies* 8 (2003): 355-384.

DECHOW, P.M. AND D.J. SKINNER. "Earnings management: Reconciling the views of accounting academics, practitioners, and regulators." *Accounting Horizons* 14 (2000): 235-250.

DECHOW, P. M., R.G. SLOAN AND A.P. SWEENEY. "Detecting earnings management." *The Accounting Review* 70 (1995): 193-225.

DEFOND, M., AND J. JIAMBALVO. "Factors related to auditor-client disagreements over income-increasing accounting methods." *Contemporary Accounting Research* 9 (1993): 415–431.

DEGEORGE, F., J. PATEL AND R. ZECKHAUSER. "Earnings management to exceed thresholds." *Journal of Business* 72 (1999): 1-33.

DEMSKI, J.S. "Endogenous expectations." *The Accounting Review* 79 (2004): 519-539.

DIETRICH, J.R., K.A. MULLER AND E.J. RIEDL. "Asymmetric timeliness tests of accounting conservatism." *Review of Accounting Studies* 12 (2007): 95-124.

EASLEY, D., S. HVIDKJAER AND M. O'HARA. "Is information risk a determinant of asset returns?" *The Journal of Finance* 57 (2002): 2185-2221.

ETTREDGE, M., Y. HUANG AND W. ZHANG. "Earnings restatements and differential timeliness of accounting conservatism." *Journal of Accounting and Economics* 53 (2012): 489-503.

EWERT, R. AND A. WAGENHOFER. "Economic effects of tightening accounting standards to restrict earnings management." *The Accounting Review* 80 (2005): 1101-1124.

FALEYE, O., R. HOITASH AND U. HOITASH. "The costs of intense board monitoring." *Journal of Financial Economics* 101 (2011): 160-181.

FRANCIS, J., R. LAFOND, P. OLSSON AND K. SCHIPPER. "The market pricing of earnings quality." *Journal of Accounting and Economics* 39 (2005): 295–327.

FRANCIS, J., E. MAYDEW, AND H. SPARKS. "The role of Big Six auditors in the credible reporting of accruals." *Auditing: A Journal of Practice and Theory* 18 (1999): 17–35.

GAO, P. "A measurement approach to conservatism and earnings management." *Journal of Accounting and Economics* 55 (2013): 251-268.

GARCIA LARA, J., B. GARCIA OSMA AND F. PENALVA. "Accounting conservatism and corporate governance." *Review of Accounting Studies* 14 (2009): 161-201.

GARCIA LARA, J., B. GARCIA OSMA AND F. PENALVA. "Conditional conservatism and cost of capital." *Review of Accounting Studies* 16 (2011): 247-271.

GARCIA LARA, J., B. GARCIA OSMA AND F. PENALVA. "Information consequences of accounting conservatism." *European Accounting Review* 23 (2014): 173-198.

GIVOLY, D. AND C. HAYN. "The changing time-series properties of earnings, cash flows and accruals: Has financial reporting become more conservative?" *Journal of Accounting and Economics* 29 (2000): 287-320.

GIVOLY, D., C. HAYN AND A. NATARAJAN. "Measuring reporting conservatism." *The Accounting Review* 82 (2007): 65-106.

GOMPERS, P., J. ISHII AND A. METRICK. "Corporate governance and equity prices." *The Quarterly Journal of Economics* 118 (2003): 107-155.

GORMLEY, T. A., B.H. KIM AND X. MARTIN. "Do firms adjust their timely loss recognition in response to changes in the banking industry?" *Journal of Accounting Research* 50 (2012): 159–196

GÖX, R. AND A. WAGENHOFER. "Optimal impairment rules." *Journal of Accounting and Economics* 48 (2009): 2-16.

GRAHAM, J.R., C.R. HARVEY AND S. RAJGOPAL. "The economic implications of corporate financial reporting." *Journal of Accounting and Economics* 40 (2005): 3-73.

GRICE, J. W. AND HARRIS, R. J. "A comparison of regression and loading weights for the computation of factor scores." *Multivariate Behavioral Research* 33 (1998): 221-248.

GUAY, W. AND R. VERRECCHIA. "Discussion of an economic framework for conservative accounting and Bushman and Piotroski (2006)". *Journal of Accounting and Economics* 42 (2006): 149-165.

HEALY, P.M. AND J.M. WAHLEN. "A review of the earnings management literature and its implications for standard setting." *Accounting Horizons* 13 (1999): 365-383.

HECKMAN, J. J. "Sample selection bias as a specification error." *Econometrica* 47 (1979): 153–161.

HERRMANN, D., T. INOUE, AND W. THOMAS. "The sale of assets to manage earnings in Japan." *Journal of Accounting Research* 41 (2003): 89–108.

HOLTHAUSEN, R. AND R. L. WATTS. "The relevance of the value-relevance literature for financial accounting standard setting." *Journal of Accounting and Economics* 31 (2001): 3-75.

JACKSON, S.B.; AND X. LIU. "Allowance for Uncollectible Accounts, Conservatism, and Earnings Management." *Journal of Accounting Research* 48 (2010): 565-601.

JAYARAMAN, S., AND L. SHIVAKUMAR. "Agency-based demand for conservatism: evidence from state adoption of antitakeover laws." *Review of Accounting Studies* 18 (2013): 95-134.

JONES, J. J. "Earnings management during import relief investigations." *Journal of Accounting Research* 29 (1991): 193-228.

KHAN, M., AND R.L.WATTS. "Estimation and empirical properties of a firm-year measure of accounting conservatism." *Journal of Accounting and Economics* 48 (2009): 132-150.

KOTHARI, S.P., A.J. LEONE, AND C.E. WASLEY. "Performance matched discretionary accruals measures." *Journal of Accounting and Economics* 39 (2005): 163-197.

LAFOND, R. AND R. L. WATTS. "The information role of conservatism." *The Accounting Review* 83 (2008): 443-478.

LO, K. "Earnings management and earnings quality." *Journal of Accounting and Economics* 45 (2008): 350-357.

MCNICHOLS, M.F. AND S. R. STUBBEN. "Does earnings management affect firms' investment decisions?" *The Accounting Review* 83 (2008): 1571-1603.

NINI, G., D.C. SMITH, AND A. SUFI. "Creditor control rights, corporate governance, and firm value." *Review of Financial Studies* 25 (2012): 1713-1761.

PATATOUKAS, P.N. AND J. K. THOMAS. "More evidence of bias in differential timeliness estimates of conditional conservatism." *The Accounting Review* 86 (2011): 1765-1794.

PETERSEN, M.A. "Estimating standard errors in finance panel data sets: Comparing approaches." *Review of Financial Studies* 22 (2009): 435-480.

POPE, P. AND M. WALKER. "International differences in timeliness, conservatism, and classification of earnings." *Journal of Accounting Research* 37 (1999): 53–99.

QIANG, X. "The effects of contracting, litigation, regulation, and tax costs on conditional and unconditional conservatism: cross-sectional evidence at the firm level." *The Accounting Review* 82 (2007): 759-797.

RAMALINGEGOWDA, S. AND Y. YU. "Institutional ownership and conservatism." *Journal of Accounting and Economics* 53 (2012): 98-114.

ROYCHOWDHURY, S. "Management of earnings through the manipulation of real activities that affect cash flow from operations." *Journal of Accounting and Economics* 42 (2006): 335-370.

SCHIPPER, K. "Commentary on earnings management." *Accounting Horizons* 3 (1989): 91-102.

SKINNER, D.J., AND R.G. SLOAN. "Earnings surprises, growth expectations and stock returns or don't let an earnings torpedo sink your portfolio." *Review of Accounting Studies* 7 (2002): 289-312.

STICE, J. "Using financial and market information to identify pre-engagement factors associated with lawsuits against auditors." *The Accounting Review* 66 (1991): 516-533.

SUIJS, J. "On the value relevance of asymmetric financial reporting policies." *Journal of Accounting Research* 46 (2008): 1297-1321.

VUOLTEENAHO, T. "What drives firm-level stock returns." *The Journal of Finance* 57 (2002): 233-264.

WATTS, R. L. "Conservatism in accounting Part I: Explanations and implications." *Accounting Horizons* 17 (2003): 207-221.

WITTENBERG-MOERMAN, R. "The role of information asymmetry and financial reporting quality in debt trading: Evidence from the secondary loan market." *Journal of Accounting and Economics* 46 (2008): 240-260.

WONGSUNWAI, W. "The effect of external monitoring on accrual-based and real earnings management: Evidence from venture-backed Initial Public Offerings." *Contemporary Accounting Research* 30 (2013): 296-324.

ZANG, A. Y. "Evidence on the trade-off between real activities manipulation and accrual-based earnings management." *The Accounting Review* 87 (2012): 675-703.

ZHANG, J. "The contracting benefits of accounting conservatism to lenders and borrowers." *Journal of Accounting and Economics* 45 (2008): 27-54.

TABLE 1
Descriptive Statistics

Panel A: Summary statistics

variable	mean	sd	p25	p50	p75	N
RM (%)	-2.81	36.63	-20.39	0.40	18.23	38,968
DA_Modified Jones (%)	0.06	8.44	-3.70	0.41	4.30	38,700
DA_Lagged Model (%)	0.09	8.10	-3.55	0.42	4.19	38,611
DA_Adapted Model (%)	0.05	8.44	-3.71	0.41	4.30	38,700
CO (unranked)	-0.01	0.68	-0.33	-0.04	0.27	38,968
Institutions (t-1)	0.49	0.28	0.25	0.48	0.72	38,968
Analysts (t-1)	6.78	7.43	1	4	10	38,968
ATI (t-1)	0.79	1.12	0	0	2	38,968
ATI_dummy	0.60	0.49	0	1	1	38,968
Market share (t-1)	0.05	0.10	0.00	0.01	0.04	38,968
Z-Score (t-1)	5.06	5.77	2.30	3.60	5.77	38,968
Low MTR	0.91	0.28	1	1	1	38,968
Auditing	0.43	0.49	0	0	1	38,968
NOA (t-1)	0.53	0.50	0	1	1	38,968
Cycle (t-1)	80.12	92.48	37.32	74.39	121.28	38,968
ROA3	3.01	12.31	-0.09	4.48	8.94	38,968
SG	0.12	0.27	-0.01	0.08	0.20	38,968
MTB	2.94	4.00	1.22	1.97	3.25	38,968
Size	5.78	1.95	4.34	5.71	7.09	38,968
Leverage	0.46	1.20	0.01	0.16	0.46	38,968
Bid/Ask spread	4.32	2.25	2.70	3.87	5.47	38,968
Earn (t-1)	3.77	13.26	-2.03	4.06	10.29	38,968

The sample comprises 38,968 firm-year observations for the period 1991-2010 RM is real earnings management computed as the addition of APROD and -1*AEXP, which are Roychowdhury's [2006] abnormal production costs and abnormal discretionary expenses, respectively. DA_Modified Jones (DA_Lagged, DA_Adapted) Jones Model are discretionary accruals obtained with the modified Jones (original Dechow et al 2003, adapted Dechow et al [2003] model. CO is a summary measure of conditional conservatism obtained as the deciles ranks of the average of the following three standardized proxies for conservatism: CO_TLR which is the three-year average of timeliness loss recognition (G_Score + C_Score). G_Score is the timeliness of earnings to good news and C_Score is the incremental timeliness of earnings to bad news as developed by Khan and Watts [2009]. CO_SKW is the negative of the ratio of the skewness of net income to the skewness of cash flow from operations. To obtain the skewness, we use rolling windows of five years ending at the current year. CO_CR is the three-year average of the conservatism ratio as developed by Callen et al. [2010]. Institutions (t-1) is the percentage of firm shares held by institutional investors, at the stat of the year. Analysts (t-1) is the number of analysts following the firm, at the stat of the year. ATI (t-1) is the alternative takeover vulnerability index developed by Cremers and Nair [2005]. It ranges from 1 to 4. If ATI is missing, we assign it a value of zero. It is measured at the stat of the year. ATI_dummy is an indicator variable that equals one if ATI is not available and zero otherwise. Market share (t-1) is the percentage of the company's sales to total sales of its 3-digit SIC industry, measured at the beginning of the year. Z-Score (t-1) is Altman's [1968] bankruptcy score measure at the beginning of the year. It equals 3.3*Net income + Sales + 1.4*Retained earnings + 1.2*Working capital + 0.6*Market value of equity, with all variables scaled by total assets except Market value of equity which is scaled by total liabilities. Low_MTR is an indicator variable that takes the value of one if the firm has a low marginal tax rate, and zero otherwise. A low marginal tax rate is assumed if the

firm's marginal tax rate is below the statutory tax rate. To measure the marginal tax rate we employ the proxy developed by Blouin et al. [2010]. Auditing is an indicator variable that equals one if the firm has a Top-8 auditor and the auditor tenure is above the sample mean, and zero otherwise. NOA (t-1) is an indicator variable that equals one if the net operating assets (i.e., shareholders' equity less cash and marketable securities and plus total debt) at the beginning of the year divided by lagged sales is above the median of the corresponding two-digit SIC industry-year, and zero otherwise. Cycle (t-1) as the days receivable plus the days inventory less the days payable, all at the beginning of the year. ROA3 is return on assets computed using net income for the rolling four quarters ending with the third quarter of year t. SG equals the change in annual sales scaled by previous year's sales. MTB is the market-to-book value of equity ratio. Size is the log of market value of equity. Leverage equals short-term plus long-term debt scaled by market value of equity. Bid/Ask spread is the bid-ask-spread defined as the annual average of daily spread scaled by the midpoint between bid and ask. Earn (t-1) is earnings before extraordinary items minus discretionary accruals from the modified Jones model, both measured at t-1.

TABLE 1 (continued)

Panel B: Pearson correlation matrix

	RM	DA_Modified Jones	DA_Lagged Model	DA_Adapted Model	CO	Institutions (t-1)	Analysts (t-1)	ATI (t-1)	ATI_dummy	Market share (t-1)	Z-Score (t-1)	Low MTR	Auditing	NOA (t-1)	Cycle (t-1)	ROA3	SG	MTB	Size	Leverage	Bid/Ask spread
DA_Modified Jones	**0.12**	**1.00**																			
DA_Lagged Model	**0.10**	**0.96**	**1.00**																		
DA_Adapted Model	**0.12**	**0.97**	**0.96**	**1.00**																	
CO	**0.13**	**0.03**	**0.02**	**0.03**	**1.00**																
Institutions (t-1)	**-0.05**	**-0.03**	**-0.03**	**-0.03**	**-0.29**	**1.00**															
Analysts (t-1)	**-0.10**	**-0.05**	**-0.05**	**-0.05**	**-0.41**	**0.44**	**1.00**														
ATI (t-1)	**-0.04**	0.00	0.00	0.00	**-0.27**	**0.40**	**0.43**	**1.00**													
ATI_dummy	**0.03**	0.00	0.00	0.00	**0.32**	**-0.50**	**-0.52**	**-0.87**	**1.00**												
Market share (t-1)	**0.02**	0.01	0.01	0.01	**-0.16**	**0.19**	**0.26**	**0.25**	**-0.30**	**1.00**											
Z-score (t-1)	**-0.14**	**-0.06**	**-0.04**	**-0.06**	**-0.21**	**0.04**	**0.08**	**-0.02**	**0.05**	**-0.09**	**1.00**										
Low MTR	**0.02**	**-0.01**	**-0.02**	-0.01	**0.11**	**-0.08**	**-0.16**	**-0.11**	**0.12**	**-0.11**	**-0.04**	**1.00**									
Auditing	0.00	**0.02**	**0.02**	**0.02**	**-0.11**	**0.18**	**0.19**	**0.27**	**-0.30**	**0.15**	**-0.05**	**-0.06**	**1.00**								
NOA (t-1)	**0.11**	**-0.04**	**-0.05**	**-0.04**	-0.01	**0.09**	**0.07**	**0.04**	**-0.05**	**-0.02**	**-0.04**	0.01	0.00	**1.00**							
Cycle (t-1)	**0.03**	**0.04**	**0.03**	**0.04**	**0.05**	**-0.07**	**-0.13**	-0.01	**0.03**	**-0.02**	**0.04**	0.00	**0.04**	**0.20**	**1.00**						
ROA	**-0.06**	**0.17**	**0.18**	**0.17**	**-0.15**	**0.10**	**0.12**	**0.12**	**-0.13**	**0.09**	**0.29**	**-0.12**	**0.08**	**-0.07**	0.00	**1.00**					
SG	**-0.01**	**0.02**	0.01	**0.01**	**-0.09**	**-0.03**	**0.02**	**-0.07**	**0.09**	**-0.07**	**0.16**	**-0.02**	**-0.08**	**0.07**	**-0.08**	**0.18**	**1.00**				
MTB	**-0.18**	**-0.05**	**-0.04**	**-0.05**	**-0.20**	**0.05**	**0.17**	**0.07**	**-0.08**	**0.03**	**0.14**	**-0.04**	0.00	**-0.09**	**-0.09**	**0.03**	**0.15**	**1.00**			
Size	**-0.10**	0.01	0.01	0.01	**-0.54**	**0.56**	**0.73**	**0.52**	**-0.62**	**0.36**	**0.12**	**-0.18**	**0.24**	**0.07**	**-0.15**	**0.26**	**0.13**	**0.28**	**1.00**		
Leverage	**0.09**	-0.01	**-0.01**	0.00	**0.16**	**-0.06**	**-0.09**	**-0.04**	**0.04**	**0.03**	**-0.19**	**0.03**	**-0.02**	**0.08**	**-0.03**	**-0.12**	**-0.06**	**-0.09**	**-0.19**	**1.00**	
Bid/Ask spread	**-0.04**	**-0.07**	**-0.07**	**-0.07**	**0.17**	**-0.27**	**-0.22**	**-0.28**	**0.33**	**-0.23**	**0.04**	**0.12**	**-0.19**	**-0.04**	0.01	**-0.35**	**-0.01**	-0.01	**-0.41**	**0.12**	**1.00**
Earn (t-1)	**-0.11**	**-0.06**	0.00	**-0.06**	**-0.16**	**0.12**	**0.15**	**0.11**	**-0.11**	**0.07**	**0.32**	**-0.11**	**0.05**	**-0.10**	**-0.05**	**0.60**	**0.02**	**0.03**	**0.21**	**-0.10**	**-0.25**

Bold figures indicate statistical significance at the 0.01 level (two-tailed). All the variables are described in the Appendix and in Table 1.A.

TABLE 2

Regressions using all available observations

	(1) RM	(2) DA_Modified Jones	(3) DA_Lagged Model	(4) DA_Adapted Model
CO	0.768***	-0.473***	-0.262***	-0.473***
	[0.000]	[0.000]	[0.000]	[0.000]
Institutions (t-1)	-5.034***	2.513***	1.072***	2.492***
	[0.000]	[0.000]	[0.000]	[0.000]
Analysts (t-1)	-0.238***	0.082***	0.012	0.082***
	[0.000]	[0.000]	[0.263]	[0.000]
ATI (t-1)	-1.387***	1.080***	0.689***	1.075***
	[0.000]	[0.000]	[0.000]	[0.000]
ATI_dummy	-3.587***	3.065***	2.024***	3.043***
	[0.000]	[0.000]	[0.000]	[0.000]
Market share (t-1)	13.720***	-10.724***	-6.942***	-10.696***
	[0.000]	[0.000]	[0.000]	[0.000]
Z-Score (t-1)	-0.418***	0.177***	0.059***	0.178***
	[0.000]	[0.000]	[0.001]	[0.000]
Low MTR	0.282	-0.362***	-0.276**	-0.353***
	[0.656]	[0.006]	[0.029]	[0.007]
Auditing	0.598	-0.396***	-0.233***	-0.394***
	[0.116]	[0.000]	[0.006]	[0.000]
NOA (t-1)	6.429***	-5.376***	-3.539***	-5.314***
	[0.000]	[0.000]	[0.000]	[0.000]
Cycle (t-1)	-0.004*	0.007***	0.005***	0.006***
	[0.076]	[0.000]	[0.000]	[0.000]
ROA3	0.037	0.202***	0.172***	0.201***
	[0.115]	[0.000]	[0.000]	[0.000]
SG	3.080***	-2.833***	-1.934***	-2.929***
	[0.000]	[0.000]	[0.000]	[0.000]
MTB	-1.263***	0.756***	0.425***	0.753***
	[0.000]	[0.000]	[0.000]	[0.000]
Size	-0.32	0.648***	0.529***	0.639***
	[0.111]	[0.000]	[0.000]	[0.000]
Leverage	1.308***	-0.879***	-0.540***	-0.876***
	[0.000]	[0.000]	[0.000]	[0.000]
Bid/Ask spread	-1.443***	0.899***	0.506***	0.892***
	[0.000]	[0.000]	[0.000]	[0.000]
Earn (t-1)	-0.228***			
	[0.000]			
Pred_RM		0.686***	0.401***	0.683***
		[0.000]	[0.000]	[0.000]

Unexp_RM		0.022***	0.020***	0.022***
		[0.000]	[0.000]	[0.000]
Constant	12.483***	-5.898***	-5.014***	-5.853***
	[0.000]	[0.000]	[0.000]	[0.000]
N	38,968	38,700	38,611	38,700
adj. R-sq	0.076	0.100	0.075	0.098

The sample contains up to 38,968 firm-year observations for the period 1991-2010. All continuous variables are winsorized at the 1 and 99 percentiles to avoid the effect of influential observations. The regressions include year fixed effects. The p-values are based on robust standard errors clustered at the firm and year level. p-values in brackets. * p<0.10, ** p<0.05, *** p<0.01. Appendix B contains all variable definitions.

TABLE 3

Logit regressions with only suspect and non-suspect firms. Suspect firms (non-suspect) are those with high (low) probability of doing earnings management

Dependent variable: Suspect	Coefficient	Marginal effect
CO	-0.019**	-0.005
	[0.011]	
Institutions (t-1)	0.01	0.002
	[0.933]	
Analysts (t-1)	-0.011**	-0.003
	[0.024]	
ATI (t-1)	-0.03	-0.007
	[0.510]	
ATI_dummy	0.222**	0.054
	[0.040]	
Habitual beater	0.251***	0.061
	[0.000]	
Habitual beater_dum	0.436***	0.107
	[0.000]	
Stock issue (t+1)	0.192***	0.046
	[0.004]	
logshares	1.011***	0.246
	[0.000]	
ROA3	0.031***	0.007
	[0.000]	
SG	0.081	0.020
	[0.502]	
Auditing	-0.095*	-0.023
	[0.063]	
Size	-0.653***	-0.159
	[0.000]	
Leverage	-0.226***	-0.055
	[0.000]	
MTB	0.024***	0.006
	[0.000]	
Bid/Ask spread	-0.132***	-0.032
	[0.000]	
Low MTR	0.198***	0.047
	[0.002]	
Constant	-1.082***	
	[0.010]	
N	15,422	

pseudo R-sq	0.127

The dependent variable, Suspect, equals one if the firm is suspect of engaging in earnings management, and zero if it is non-suspect. The sample contains only suspect and non-suspect firms of engaging in earnings management. Suspect firms are either a) firm-years with earnings before extraordinary items over lagged assets between 0 and 0.005; or b) firm-years with change in basic EPS excluding extraordinary items from last year between zero and two cents; or c) firm-years with actual EPS less the last analyst forecast consensus before the fiscal year end between zero and one cent. Non-suspect firms are a) firm-years that miss or beat the zero earnings benchmark by more than 2.5% of lagged total assets, and b) firm-years that miss or beat analyst forecast consensus, and c) firm-years that miss or beat last-year EPS by more than five cents. All continuous variables are winsorized at the 1 and 99 percentiles to avoid the effect of influential observations. The regressions include year fixed effects. The p-values are based on robust standard errors clustered at the firm and year level. p-values in brackets. * $p<0.10$, ** $p<0.05$, *** $p<0.01$. Appendix B contains all variable definitions.

TABLE 4

Regressions with only suspect and non-suspect firms. Suspect firms (non-suspect) are those with high (low) probability of engaging in earnings management

	(1)	(2)	(3)	(4)
	RM	DA_Modified Jones	DA_Lagged Model	DA_Adapted Model
CO	0.808***	-0.472***	-0.276***	-0.472***
	[0.000]	[0.000]	[0.000]	[0.000]
Institutions (t-1)	-3.761***	1.337***	0.477	1.340***
	[0.006]	[0.001]	[0.204]	[0.001]
Analysts (t-1)	-0.412***	0.162***	0.057**	0.162***
	[0.000]	[0.000]	[0.013]	[0.000]
ATI (t-1)	-1.726***	1.121***	0.707***	1.116***
	[0.000]	[0.000]	[0.000]	[0.000]
ATI_dummy	-2.337*	1.852***	1.323***	1.837***
	[0.062]	[0.000]	[0.000]	[0.000]
Market share (t-1)	13.264***	-10.709***	-7.546***	-10.727***
	[0.000]	[0.000]	[0.000]	[0.000]
Z-Score (t-1)	-0.432***	0.151***	0.046	0.152***
	[0.000]	[0.000]	[0.127]	[0.000]
Low MTR	0.389	-0.411*	-0.27	-0.403*
	[0.695]	[0.054]	[0.193]	[0.059]
Auditing	1.473**	-1.096***	-0.714***	-1.089***
	[0.016]	[0.000]	[0.000]	[0.000]
NOA (t-1)	7.423***	-6.062***	-4.200***	-6.002***
	[0.000]	[0.000]	[0.000]	[0.000]
Cycle (t-1)	-0.001	0.006***	0.005***	0.006***
	[0.745]	[0.000]	[0.000]	[0.000]
ROA3	0.038	0.221***	0.190***	0.220***
	[0.288]	[0.000]	[0.000]	[0.000]
SG	3.812***	-3.593***	-2.659***	-3.679***
	[0.003]	[0.000]	[0.000]	[0.000]
MTB	-1.184***	0.680***	0.410***	0.679***
	[0.000]	[0.000]	[0.000]	[0.000]
Size	1.151***	-0.187*	0.082	-0.190*
	[0.001]	[0.076]	[0.398]	[0.070]
Leverage	2.505***	-1.731***	-1.151***	-1.730***
	[0.000]	[0.000]	[0.000]	[0.000]
Bid/Ask spread	-1.736***	1.019***	0.587***	1.016***
	[0.000]	[0.000]	[0.000]	[0.000]
Earn (t-1)	-0.242***			
	[0.000]			

Pred_RM		0.661***	0.407***	0.659***
		[0.000]	[0.000]	[0.000]
Unexp_RM		0.022***	0.020***	0.022***
		[0.000]	[0.000]	[0.000]
Constant	1.302	-1.01	-0.038	-1.005
	[0.711]	[0.249]	[0.958]	[0.251]
N	15,422	15,296	15,266	15,296
adj. R-sq	0.084	0.119	0.095	0.118

The sample contains only suspect and non-suspect firms of engaging in earnings management. Suspect firms are either a) firm-years with earnings before extraordinary items over lagged assets between 0 and 0.005; or b) firm-years with change in basic EPS excluding extraordinary items from last year between zero and two cents; or c) firm-years with actual EPS less the last analyst forecast consensus before the fiscal year end between zero and one cent. Non-suspect firms are a) firm-years that miss or beat the zero earnings benchmark by more than 2.5% of lagged total assets, and b) firm-years that miss or beat analyst forecast consensus, and c) firm-years that miss or beat last-year EPS by more than five cents. All continuous variables are winsorized at the 1 and 99 percentiles to avoid the effect of influential observations. The regressions include year fixed effects. The p-values are based on robust standard errors clustered at the firm and year level. p-values in brackets. * p<0.10, ** p<0.05, *** p<0.01. Appendix B contains all variable definitions.

TABLE 5

Panel A: Descriptive statistics of first-stage regression variables

variable	mean	sd	p25	p50	p75	N
Habitual beater	0.995	1.440	0.000	0.000	2.000	95,487
Habitual beater_dum	0.593	0.491	0.000	1.000	1.000	95,487
Stock issue (t+1)	0.756	0.429	1.000	1.000	1.000	95,487
Analysts	4.712	6.761	0.000	2.000	7.000	95,487
MTB	3.476	5.541	1.197	1.983	3.527	95,487
Size	5.157	2.283	3.526	5.089	6.727	95,487
Leverage	0.609	2.057	0.012	0.161	0.545	95,487
Shares	2.979	1.857	1.992	3.006	4.056	95,487
ROA3	-2.486	20.874	-5.314	2.987	7.858	95,487

Panel B: Heckman procedure first-stage regression

Habitual beater	0.083***
	[0.000]
Habitual beater_dum	-0.079***
	[0.000]
Stock issue (t+1)	0.116***
	[0.000]
Analysts	0.013***
	[0.000]
MTB	0.012***
	[0.000]
Size	-0.149***
	[0.000]
Leverage	-0.042***
	[0.000]
Shares	0.188***
	[0.000]
ROA3	0.007***
	[0.000]
Constant	-1.341***
	[0.000]
N	95,487
pseudo R-sq	0.055

The dependent variable equals one if the firm is suspect of having engaged in earnings management, and zero otherwise. Suspect firms are either a) firm-years with earnings before extraordinary items over lagged assets between 0 and 0.005; or b) firm-years with change in basic EPS excluding extraordinary items from last year between zero and two cents; or c) firm-years with actual EPS less the last analyst forecast consensus before the fiscal year end between zero and one cent. The regressions include year fixed effects. The p-values are based on robust standard errors clustered at the firm and year level. p-values in brackets. * p<0.10, ** p<0.05, *** p<0.01. Appendix B contains all variable definitions.

TABLE 5 (continued)

Panel C: Heckman procedure second-stage regression (only suspect firms)

	(1) RM	(2) DA_Modified Jones	(3) DA_Lagged Model	(4) DA_Adapted Model
CO	0.837***	-0.493***	-0.242***	-0.488***
	[0.000]	[0.000]	[0.000]	[0.000]
Institutions (t-1)	-3.825*	2.076***	0.871*	2.056***
	[0.086]	[0.000]	[0.079]	[0.000]
Analysts (t-1)	-0.023	-0.042**	-0.048**	-0.041*
	[0.816]	[0.044]	[0.017]	[0.051]
ATI (t-1)	-1.541**	1.056***	0.546***	1.047***
	[0.038]	[0.000]	[0.000]	[0.000]
ATI_dummy	-2.488	1.889***	1.068***	1.842***
	[0.210]	[0.000]	[0.007]	[0.000]
Market share (t-1)	15.057***	-10.945***	-5.941***	-10.893***
	[0.001]	[0.000]	[0.000]	[0.000]
Z-Score (t-1)	-0.368***	0.204***	0.086***	0.203***
	[0.000]	[0.000]	[0.009]	[0.000]
Low MTR	2.062	-1.133***	-0.539*	-1.127***
	[0.207]	[0.000]	[0.076]	[0.000]
Auditing	2.612***	-1.825***	-1.017***	-1.812***
	[0.009]	[0.000]	[0.000]	[0.000]
NOA (t-1)	10.054***	-7.649***	-4.448***	-7.536***
	[0.000]	[0.000]	[0.000]	[0.000]
Cycle (t-1)	-0.008	0.008***	0.005***	0.008***
	[0.206]	[0.000]	[0.000]	[0.000]
ROA3	0.077	0.121***	0.101***	0.119***
	[0.293]	[0.000]	[0.000]	[0.000]
SG	7.887***	-7.380***	-4.815***	-7.358***
	[0.001]	[0.000]	[0.000]	[0.000]
MTB	-1.298***	0.787***	0.402***	0.782***
	[0.000]	[0.000]	[0.000]	[0.000]
Size	-0.084	0.344***	0.267**	0.332***
	[0.883]	[0.004]	[0.021]	[0.005]
Leverage	2.129***	-1.318***	-0.709***	-1.307***
	[0.000]	[0.000]	[0.000]	[0.000]
Bid/Ask spread	-1.619***	1.098***	0.622***	1.086***
	[0.000]	[0.000]	[0.000]	[0.000]
Earn (t-1)	-0.235***			
	[0.000]			
IMR	12.682***	-7.477***	-3.457***	-7.415***
	[0.000]	[0.000]	[0.000]	[0.000]

Pred_RM		0.682***	0.363***	0.676***
		[0.000]	[0.000]	[0.000]
Unexp_RM		0.027***	0.024***	0.027***
		[0.000]	[0.000]	[0.000]
Constant	-22.230***	11.062***	4.815**	11.010***
	[0.010]	[0.000]	[0.018]	[0.000]
N	6,193	6,135	6,125	6,135
adj. R-sq	0.108	0.092	0.053	0.090

The sample only contains firms that are suspect of engaging in earnings management. Suspect firms are either a) firm-years with earnings before extraordinary items over lagged assets between 0 and 0.005; or b) firm-years with change in basic EPS excluding extraordinary items from last year between zero and two cents; or c) firm-years with actual EPS less the last analyst forecast consensus before the fiscal year end between zero and one cent. All continuous variables are winsorized at the 1 and 99 percentiles to avoid the effect of influential observations. The regressions include year fixed effects. The p-values are based on robust standard errors clustered at the firm and year level. p-values in brackets. * p<0.10, ** p<0.05, *** p<0.01. Appendix B contains all variable definitions.

TABLE 6

Earnings management proxies are performance-matched (on ROA & SG) using the non-suspect firms as control sample

Heckman procedure second-stage regression

	(1) RM	(2) DA_Modified Jones	(3) DA_Lagged Model	(4) DA_Adapted Model
CO	0.655**	-0.717***	-0.383***	-0.710***
	[0.033]	[0.000]	[0.003]	[0.000]
Institutions (t-1)	-2.481	2.405**	1.629*	2.394**
	[0.471]	[0.011]	[0.074]	[0.011]
Analysts (t-1)	0.02	-0.070*	-0.059	-0.068*
	[0.906]	[0.066]	[0.116]	[0.072]
ATI (t-1)	-1.022	1.606***	1.092***	1.609***
	[0.387]	[0.000]	[0.000]	[0.000]
ATI_dummy	1.064	-0.02	0.508	-0.031
	[0.736]	[0.977]	[0.459]	[0.965]
Market share (t-1)	17.434***	-20.515***	-11.893***	-20.460***
	[0.009]	[0.000]	[0.000]	[0.000]
Z-Score (t-1)	-0.251*	0.273***	0.129**	0.272***
	[0.077]	[0.000]	[0.043]	[0.000]
Low MTR	2.515	-2.043***	-1.06	-2.044***
	[0.318]	[0.003]	[0.108]	[0.003]
Auditing	6.003***	-7.093***	-4.172***	-7.053***
	[0.000]	[0.000]	[0.000]	[0.000]
NOA (t-1)	11.246***	-14.691***	-9.206***	-14.549***
	[0.000]	[0.000]	[0.000]	[0.000]
Cycle (t-1)	-0.018**	0.024***	0.014***	0.024***
	[0.044]	[0.000]	[0.000]	[0.000]
ROA3	0.077	0.077***	0.074***	0.075***
	[0.482]	[0.002]	[0.003]	[0.003]
SG	11.689***	-17.462***	-11.334***	-17.242***
	[0.002]	[0.000]	[0.000]	[0.000]
MTB	-1.012***	1.132***	0.652***	1.131***
	[0.000]	[0.000]	[0.000]	[0.000]
Size	-0.601	0.955***	0.596***	0.940***
	[0.491]	[0.000]	[0.008]	[0.000]
Leverage	2.415***	-2.709***	-1.579***	-2.695***
	[0.005]	[0.000]	[0.000]	[0.000]
Bid/Ask spread	-1.135**	1.488***	0.983***	1.481***
	[0.025]	[0.000]	[0.000]	[0.000]
Earn (t-1)	-0.141*			
	[0.076]			

IMR	16.535***	-19.992***	-11.806***	-19.882***
	[0.001]	[0.000]	[0.000]	[0.000]
Pred_RM		1.237***	0.736***	1.230***
		[0.000]	[0.000]	[0.000]
Unexp_RM		0.029***	0.025***	0.029***
		[0.000]	[0.000]	[0.000]
Constant	-38.876***	29.646***	17.000***	29.477***
	[0.003]	[0.000]	[0.001]	[0.000]
N	5,385	4,970	4,960	4,970
adj. R-sq	0.048	0.05	0.033	0.049

The sample only contains firms that are suspect of engaging in earnings management. The dependent variables have been performance-matched on ROA and sales growth using as controls a sample of non-suspect firms. Suspect firms are either a) firm-years with earnings before extraordinary items over lagged assets between 0 and 0.005; or b) firm-years with change in basic EPS excluding extraordinary items from last year between zero and two cents; or c) firm-years with actual EPS less the last analyst forecast consensus before the fiscal year end between zero and one cent. All continuous variables are winsorized at the 1 and 99 percentiles to avoid the effect of influential observations. The regressions include year fixed effects. The p-values are based on robust standard errors clustered at the firm and year level. p-values in brackets. * $p<0.10$, ** $p<0.05$, *** $p<0.01$. Appendix B contains all variable definitions.

TABLE 7

Means of selected characteristics of CO deciles

CO decile	CO_TLR	CO_SKW	CO_CR	ROA	MTB	Size	Leverage	Cycle	Volatility	Bid/Ask	PIN	Age
1	0.04	-8.24	0.32	0.06	4.92	7.70	0.26	74.00	0.03	3.76	0.15	22.97
2	0.07	-1.56	0.33	0.05	3.69	7.24	0.26	73.48	0.03	3.72	0.16	20.04
3	0.09	-0.87	0.35	0.04	3.21	6.61	0.29	77.44	0.03	3.98	0.18	17.96
4	0.11	-0.48	0.37	0.02	3.15	6.13	0.34	79.95	0.03	4.17	0.19	17.19
5	0.13	-0.22	0.42	0.02	2.96	5.79	0.38	80.50	0.03	4.31	0.20	16.47
6	0.14	0.08	0.45	0.01	2.72	5.46	0.42	80.50	0.04	4.48	0.22	16.50
7	0.16	0.46	0.50	0.01	2.57	5.14	0.46	82.82	0.04	4.56	0.23	17.02
8	0.17	0.80	0.59	0.01	2.30	4.81	0.52	83.26	0.04	4.58	0.26	16.68
9	0.19	1.54	0.76	0.00	1.99	4.45	0.68	86.72	0.04	4.73	0.28	16.73
10	0.21	8.30	1.40	0.01	1.94	4.54	1.02	85.72	0.04	4.89	0.27	16.77
Rank correlation	1.00	1.00	1.00	-0.92	-1.00	-0.99	0.99	0.96	0.99	0.99	0.99	-0.65
Predicted sign	+	+	+	–	–	–	+	+	+	+	+	–

Rank correlation is the rank correlation between the CO decile and the column ranking, and is a measure of the monotonicity of the ranking in the table.

CO_TLR is the three-year average of timeliness loss recognition (G_Score + C_Score). G_Score is the timeliness of earnings to good news and C_Score is the incremental timeliness of earnings to bad news as developed by Khan and Watts (2009). CO_SKW is the negative of the ratio of the skewness of net income to the skewness of cash flow from operations. To obtain the skewness, we use rolling windows of five years ending at the current year. CO_CR is the three-year average of the conservatism ratio as developed by Callen et al. [2010]. ROA is return on assets computed using net income for the rolling four quarters ending with the third quarter of year t. MTB is the market-to-book value of equity ratio. Size is the log of market value of equity. Leverage equals short-term plus long-term debt scaled by market value of equity. Cycle is the days of receivables plus the days of inventory less the days of payables, all at the beginning of the year. Volatility is the standard deviation of one year of daily stock returns. Bid/Ask spread is the annual average of the daily spread scaled by the midpoint between bid and ask. PIN is a score based on the probability of an informed trade, as developed by Easley, Hvidkjaer and O'Hara [2002] Age is the difference between the first year when the firm appears in CRSP and the current year.