Accruals and long-term nonfinancial assets and liabilities

Carl Brousseau*
Laval University, Quebec City, Canada
carl.brousseau@ctb.ulaval.ca

Cédric Poretti
EHL Hospitality Business School, Lausanne, Switzerland
cedric.poretti@ehl.ch

Forthcoming at European Accounting Review

Abstract

This study proposes improvements to accrual models. Existing models explain how working capital maps cash flows from operations into earnings and how this mapping reflects accounting conservatism. However, except for fixed asset depreciation, accruals associated with long-term nonfinancial balance sheet accounts (e.g., intangible assets, goodwill, deferred revenues) are not modeled. We show that these unmodeled accruals have grown in importance over time and that a significant portion of them can be explained by utilizing a fundamental property of accrual accounting: most nonfinancial assets and liabilities will eventually be transferred to earnings as accruals, especially during bad times. Using a large U.S. sample for the 1988-2019 period, we document that beginning-of-year long-term nonfinancial assets and liabilities are significantly associated with total accruals and that, consistent with conditional conservatism, a greater proportion of long-term nonfinancial assets is expensed as accruals when current performance is poor. In simulations, compared to traditional models, models that include long-term nonfinancial assets and liabilities as regressors are more likely to detect seeded discretionary accruals between 2% and 20% of total assets, suggesting that these expanded models should be used to decrease the likelihood of making erroneous inferences.

Keywords : Accruals; long-term nonfinancial balance sheet accounts; conservatism.
JEL classifications: M41; D25; G34; G38.

* Corresponding author. Accepted by Jeffrey Ng. Submitted on June 6, 2023; accepted on August 27, 2024. Additional materials are available in an Online Appendix at the journal's Taylor and Francis website. We gratefully acknowledge constructive comments from Christof Beuselinck, Zvi Singer, Jean Bédard, Jeffrey Ng, anonymous reviewers, and participants of the European Accounting Association Annual Congress 2018 (Milan, Italy), the French Accounting Association Conference 2019 (AFC, Paris, France) and workshops at Université Laval and HEC Montréal for helpful comments and suggestions.

Accruals and long-term nonfinancial assets and liabilities

1. Introduction

Archival research in financial accounting has long broken down earnings into cash flows from operations and accounting adjustments called accruals (e.g., Rayburn, 1986). Accruals are less persistent than cash flows from operations (Sloan, 1996) and are jointly determined by the firm's economic circumstances and accountants' interpretation of those circumstances, which may lead to intentional or unintentional errors (e.g., Healy, 1985; Dechow & Dichev, 2002, hereafter DD). Beginning with Jones (1991), the accrual determination process has attracted researchers' attention in a wide variety of contexts such as seasoned equity offerings (Teoh et al., 1998), management compensation (Efendi et al., 2007), market efficiency (Xie, 2001), the cost of capital (Francis et al., 2005) or audit quality (Becker et al., 1998).

Over time, researchers have suggested methodological improvements (e.g., DeFond & Jiambalvo, 1994; Dechow et al., 1995; Chen et al., 2018) and argued for the inclusion of additional economic factors (e.g., DD; Larcker & Richardson, 2004; Kothari et al., 2005; Ball & Shivakumar, 2006). Despite this, model misspecification issues remain and the magnitude of the resulting abnormal accruals is regularly characterized as implausibly large (e.g., Owens et al., 2017). Further stressing the need for further efforts, the models' explanatory power has significantly declined over time (Bushman et al., 2016), and audit inspection deficiencies are more strongly associated with total accruals than with model-derived unexpected accruals (Aobdia, 2019).

The most widely used models (e.g., Jones, 1991; DD) were designed to explain a subset of accounting adjustments that can be labeled as *traditional accruals* (working capital accruals and depreciation), which stem from the application of long-standing accounting principles regarding revenue recognition and matching, bad debt or inventory impairment. Except for the depreciation of property, plant and equipment (PP&E), traditional accruals are only associated with current assets and liabilities. However, consistent with Hribar and Collins' (2002, p. 110) remark that '[accruals other than traditional accruals] are undoubtedly important for certain types of earnings management', most of the literature has since used *total accruals*, the difference between earnings and cash flows from operations (hereafter CFO), as the dependent variable in empirical tests.[1] The difference between traditional and total accruals is *other accruals*, a group of adjustments that essentially relate to long-term nonfinancial assets and liabilities. Other accruals include elements such as impairment losses, the amortization of intangibles, changes in unearned revenues and deferred taxes. If the objective is to estimate discretionary (total) accruals, unless other accruals represent statistical noise or have the same determinants as traditional accruals, traditional models suffer from omitted variable bias that pose the risk of drawing erroneous inferences.

Further highlighting the need to investigate whether to include additional explanatory variables, as a consequence of shifts in economic fundamentals and accounting standards (e.g., Givoly & Hayn, 2000; Srivastava, 2014), the composition of total accruals has changed since the beginning of the statement of cash flows era in 1987. As Figure 1 shows, the gap between traditional and total accruals – in other words, other accruals – widened over the 1988-2019 period for the average U.S. nonfinancial firm, as total accruals declined from -4% to -8% of total assets while traditional accruals remained flat at around -4%. More importantly for the cross-sectional estimation of discretionary accruals, Figure 2 shows a gradual decline in the cross-sectional dispersion of traditional accruals and an increase in the cross-sectional dispersion of other accruals. In other words, other accruals are an increasingly important element in the variation of total accruals across firms, yet the most widely used models were not intended to explain them as the models were designed in an era during which they were relatively less important.

[INSERT FIGURES 1 AND 2]

In this paper, we investigate whether long-term nonfinancial assets and liabilities are associated with total accruals and we propose improvements to existing accrual models. DD suggest that working capital accruals help adjust the recognition of short-term (past and future) CFO into earnings so that earnings better reflect firm performance. We extend their model and argue that other accrual categories play a similar role in mapping cash flows from *investing* activities (hereafter CFI) and long-term CFO to firm performance. For example, the cost of PP&E and capitalized intangibles, reported as CFI in the acquisition year, is subsequently recognized in

[1] Some researchers define accruals more broadly as the net change in all non-cash assets and liabilities (e.g., Richardson et al., 2005; Larson et al., 2018). See section 2.2 for a discussion of accrual definitions.

earnings through depreciation, amortization or impairment. To avoid having to include a long series of past CFI and CFO as explanatory variables for current-year accruals, we take advantage of a fundamental property of accrual accounting: over time, long-term nonfinancial assets (liabilities) are systematically expensed (realized) as income-decreasing (increasing) accruals.[2] In other words, we extend the rationale behind the inclusion of PP&E as a regressor in Jones (1991) and suggest adding *beginning-of-year* other long-term nonfinancial assets (*ONA*) and other long-term nonfinancial liabilities (*ONL*) as explanatory variables (hereafter the augmented model).[3] Figure 3 shows that the growing importance of *ONA* and *ONL* on the balance sheet parallels the growing importance of other accruals as a component of total accruals.

[INSERT FIGURE 3]

The inclusion of long-term nonfinancial balance sheet accounts also allows the modeling of an expanded role for conservatism in accrual models (e.g., Ball & Shivakumar, 2006; Byzalov & Basu, 2016). We argue that a factor affecting the recognition of economic losses through accruals is the existence of assets subject to impairment loss testing. Specifically, we suggest that the firm's economic situation affects the magnitude of the association between accruals and PP&E, *ONA* and *ONL*, and we add interaction terms between these three variables and an indicator for economic bad news as additional explanatory variables (hereafter the full model).

Using U.S. data for the 1988-2019 period, we show that *ONA* and *ONL* are significantly associated with total accruals and that this contribution comes from *ONA* and *ONL*'s ability to explain other (untraditional) accruals. Moreover, we show that a greater proportion of beginning-of-year long-term nonfinancial assets is expensed as accruals when current performance is poor.

To further illustrate the importance of *ONA* and *ONL*, we run simulations in which we artificially manipulate reported accruals by adding amounts between 2% and 20% of total assets and test the ability of various models to detect the manipulation (e.g., Dechow et al., 1995; Ecker

---

2 Warren Buffett discusses the amortization of Berkshire Hathaway's intangible assets in the firm's 2015 annual report (p. 15): 'We now have $6.8 billion left of amortizable intangibles, of which $4.1 billion will be expensed over the next five years. Eventually, of course, every dollar of these "assets" will be charged off. When that happens, reported earnings increase even if true earnings are flat. (My gift to my successor.)' (https://www.berkshirehathaway.com/2015ar/2015ar.pdf, accessed online on March 13, 2024.)

3 *ONA* is the sum of long-term nonfinancial assets minus PP&E and *ONL* is the sum of long-term nonfinancial liabilities. See section 2.3 for a discussion of these terms.

et al., 2013). The results indicate that compared to existing benchmarks, the full model is more effective at detecting seeded discretionary accruals and that its superiority is most pronounced for firms with higher amounts of *ONA*. We attribute this finding to traditional models overstating (understating) normal (discretionary) accruals for firms with more intangibles and goodwill, especially when economic performance is poor. We conclude that the inclusion as independent variables of balance sheet accounts representing net cumulative investments and their interaction with a proxy for economic news can significantly improve the specification of accrual models.

Our findings have both theoretical and practical implications for archival accounting research. First, we provide new insights about the measurement of discretionary accruals by documenting that the context in which accrual models are used has drastically changed since the statement of cash flows was first mandated in 1987. We document robust evidence that a portion of accruals left unexplained by existing models – and therefore considered as discretionary – is associated with other long-term nonfinancial assets and liabilities. Second, we expand the modeling of the role played by accounting conservatism in the determination of accruals. Our full model shows that the presence of unfavorable economic circumstances accelerates the rate of conversion of existing long-term nonfinancial assets and liabilities to accruals. This evidence and simulation results suggest that the use of models without these accrual determinants may lead researchers to detect earnings management practices and spurious relationships when there are none (or vice-versa). Therefore, we recommend that future studies interested in using discretionary accruals in their models – either as a dependent or an independent variable – consider our full model to avoid drawing erroneous inferences. Finally, our study contributes to the literature on the analysis of the evolution of accounting information quality and usefulness (e.g., Givoly & Hayn, 2000; Srivastava, 2014; Green et al., 2022; Christensen et al., 2023). We extend this area of research by documenting how changes in balance sheet components impact the composition of total accruals, and in turn the need to adapt abnormal accruals estimation.

The rest of the article is organized as follows. Section 2 reviews background literature on accruals and develops our models. Section 3 provides results of tests using archival and simulation data. Section 4 discusses additional results, and section 5 concludes.

2. Background literature and models

2.1. Accrual models

Most uses of accrual models are grounded in the assumption that many accruals are 'normal' and that the researcher's objective is to examine the determinants and/or consequences of deviations from normality. Breaking down earnings into CFO and accruals, normal (abnormal) accruals are the fitted value (the residual) in a regression of accruals on economic determinants (e.g., Jones, 1991). Because cross-sectional heterogeneity in accrual-generating processes reduces explanatory power, studies have argued for better identification of peer firms by matching on firm size (Ecker et al., 2013), listing recency (Srivastava, 2019) or idiosyncratic shocks (Owens et al., 2017).

Models used by researchers are mostly derived from Jones (1991) or DD. In Jones-based uses, differences in research design are driven by whether and how to account for firm performance. To illustrate, consider the model in Abbott et al. (2016):

$$ACC_t = \beta_1 + \beta_2(1/AT_{t-1}) + \beta_3 \Delta SALE_t + \beta_4 PPEGT_t + \beta_5 ROA_{t-1} \text{ [or } ROA_t\text{]} + \varepsilon_t \quad (1)$$

In Eq. (1), ACC_t is 'accruals', AT_{t-1} is lagged total assets, $\Delta SALE_t$ is the change in sales minus the change in accounts receivable (Dechow et al., 1995), $PPEGT_t$ is the historical cost of PP&E, and ROA_{t-1} (ROA_t) is lagged (current) earnings, included as a control for performance (Kothari et al., 2005); all variables are scaled by AT_{t-1}. Some articles exclude ROA_{t-1}/ROA_t and use performance-matched abnormal accruals instead.[4]

Differences in DD-based implementation depend on whether or not growth and PP&E are included as regressors (McNichols, 2002) and whether the model accounts for the conservatism-induced nonlinear association between accruals and current performance (Ball & Shivakumar, 2006). A complete version is the following model, slightly adapted from Frankel et al. (2016):

$$\begin{aligned} ACC_t = {} & \beta_1 + \beta_2 CFO_{t-1} + \beta_3 CFO_t + \beta_4 DCF_t + \beta_5 DCF_t{*}CFO_t + \beta_6 CFO_{t+1} \\ & + \beta_7 \Delta SALE_t + \beta_8 PPEGT_t + \varepsilon_t \end{aligned} \quad (2)$$

[4] The inclusion of ROA_t as a regressor is problematic when total accruals are the dependent variable. Since total accruals are a significant component of earnings, they are 'explained' by ROA_t in the regression model, but the association is mechanical.

In Eq. (2), CFO_{t-1} (CFO_t, CFO_{t+1}) is CFO in the previous (current, next) period and DCF_t is a binary variable equal to one when CFO_t is negative. Some versions of this model use a different proxy than CFO, for example abnormal returns, to proxy for current performance.[5]

2.2. Definitions of 'accruals'

The empirical proxy for 'accruals' – the dependent variable in the equations above – has implications for model specification. Both traditional model categories were designed around working capital accruals (*WCACC*): Jones (1991) measured accruals as *WCACC* minus depreciation while DD modeled *WCACC* only. The focus on these accruals was in part driven by data availability: a direct breakdown of earnings into CFO and (total) accruals was unavailable prior to the reporting of the statement of cash flows, which began with the 1987 adoption of SFAS 95 in the U.S. (and, in some other countries, the 2005 adoption of IFRS).[6]

A solution was to indirectly estimate *WCACC* from consecutive balance sheets, but there are two downsides. First, *WCACC* are measured erroneously when 'non-articulation events' such as mergers or discontinued operations occur (Hribar & Collins, 2002). Second and more importantly for this paper, the balance sheet approach cannot be applied to many long-term assets and liabilities because many changes to such accounts arise from *investing* activities and therefore do not bridge the gap between earnings and CFO. As a result, accruals associated with long-term balance sheet accounts were excluded from modeling unless directly reported elsewhere (i.e., depreciation), thus limiting the ability of the model to correctly identify earnings management or estimation errors associated with these assets and liabilities.

To avoid these issues, Hribar and Collins (2002) suggest focusing on total accruals (*TOTACC*, the difference between earnings and CFO reported on the statement of cash flows) instead of traditional accruals. Accordingly, most recent archival studies of post-1987 U.S. data use *TOTACC* as the dependent variable to be explained, with the consequence that models

---

5 Other studies use models that are neither based on Jones (1991) nor DD. These studies typically use AR(1) models or a similar own-firm benchmark (e.g., Lamoreaux, 2016) or predict specific accrual accounts (e.g., Choudhary et al., 2016).

6 Data availability is not the only reason. For example, DD (p. 37) argue that tractability would be compromised if their model, which maps past, current and future cash flows to current accruals, was extended to long-term accruals. We discuss how long-term nonfinancial assets and liabilities can mitigate some of these tractability issues below.

designed to explain *traditional* accruals are now used to explain *total* accruals, a more comprehensive measure that includes the amortization of intangibles, long-term deferred charges, deferred taxes, impairment losses, long-term deferred revenues and provisions, and others. As a result, the portion of *TOTACC* that is unrelated to sales growth, fixed asset intensity, short-term CFO and/or recent performance is left unexplained by the model and therefore deemed entirely attributable to earnings management or estimation error, thus resulting in model misspecification.

In related research, Guay and Sidhu (2001) show that stock returns are more strongly associated with contemporaneous aggregate earnings than with alternative performance measures that exclude long-term accruals or all accruals. However, they find that the magnitude of this association is lower for long-term accruals than for CFO or short-term accruals. In other words, long-term accruals enhance earnings as a measure of firm performance but have lower value-relevance: they are 'discounted' relative to other earnings components, and depreciation is the strongest driver of this discounting. A possible explanation for this result is that the depreciation of PP&E and the amortization of intangibles, which are largely determined by existing asset balances and known allocation rules, contain comparatively little of the new forward-looking information that markets are known to react to.

In contrast with Guay and Sidhu (2001) who examine consequences of the accrual process, we aim to gain a better understanding of accrual determinants by modeling the association between balance sheet accounts and accruals. In that context, the fact that some long-term accruals like depreciation and amortization are more grounded in historical balance sheet data than in forward-looking estimates may serve as an advantage in explaining total accruals, despite their limited relevance to explain stock returns. Conversely, some other long-term accruals (e.g., expenses related to a liability for future environmental costs) may be associated with stock returns even if they cannot be explained using historical data.

Other related research investigates 'comprehensive accruals', which encompass all changes in non-cash assets and liabilities (e.g., Richardson et al., 2005). Under this broader definition, transactions such as fixed asset acquisitions are positive accruals (i.e., if not for the recording of an asset, earnings would be negative due to the negative cash outflow), while the issuance of long-term debt is a negative accrual (i.e., if not for the liability, the cash inflow would have been booked as earnings). In this paper, we use a more common definition: *total accruals are the non-cash* *component of earnings* (i.e., net income equals CFO plus total accruals). We do this because accrual models are almost always estimated in the context of this definition, and modeling all investing- and financing-related accruals would require controlling for a significant number of firm-specific factors, making estimation unwieldy in large samples. Additionally, a large proportion of unexpected accruals would not necessarily be driven by accounting choices. Nevertheless, there are similarities between Richardson et al.'s (2005) categorization of accruals through balance sheet accounts and ours. We discuss these similarities and the theoretical links between cash flows, accruals and the balance sheet in the next section.

2.3. Cash flows, accruals, and nonfinancial balance sheet accounts

Cash flows, accruals and nonfinancial balance sheet accounts are mechanically associated through accrual accounting principles. Accruals shift cash flows from the period in which they are received or paid to the period in which economic performance is deemed realized (Dechow, 1994). This broad objective combines a 'noise reduction' role that mechanically reassigns cash flows to periods consistent with economic performance (e.g., revenue is recorded when earned) with a 'gain and loss recognition' role intended to record timely revisions to expected future economic benefits (e.g., goodwill is written down after failing an impairment test).

DD explicitly model working capital accruals' noise reduction role by linking them to short-term past, current and future CFO. They show that two factors reduce the model's explanatory power: (a) accruals include estimation errors made in forward-looking estimates in the current period and reversals of prior-period estimation errors, and (b) observable measures of CFO suffer from measurement error, because transactions that are both initiated and settled in the same period affect CFO but are unassociated with accruals. This latter factor is the main deterrent to modeling the association between long-term cash flows and current-year accruals, because the model would need to include a long time series of CFO that would be largely irrelevant to current-year accruals, as well as cash flows from other categories (i.e., cash flows from investing or financing activities).

However, the balance sheet is the accounting tool that enables the articulation of long-term past cash flows and current-year accruals. For example, PP&E depreciation, a major accrual for most firms, is associated with a long series of past cash outflows (and future cash inflows, as expected residual value affects depreciation). A generalized DD-style model would be intractable because the weights on investing cash flows in individual years would be firm-specific or even firm-year-specific, but a fact remains: the amount of this year's depreciation is always mechanically associated with the beginning-of-year PP&E balance.[7] The same reasoning extends to intangible asset amortization and the recognition of other long-term deferred revenues and expenses in earnings, all of which are conditional on the existence of beginning-of-year asset and liability balances. In other words, long-term assets and liabilities are natural proxies for an intractable longer time series of past and future cash flows. Appendix B formalizes the role of existing book values in replacing an intractably long time series of cash flows, and Table 1 summarizes the association between balance sheet accounts, cash flow categories, and accruals.

[INSERT TABLE 1]

Ball and Shivakumar (2006) argue that conservative accounting rules (e.g., lower of cost or market value, impairment testing) imply an asymmetric fulfilment of the 'gain and loss recognition' of accruals, as negative revisions are more likely than positive revisions to be contemporaneously incorporated into accruals and earnings. Using a model similar to Eq. (2), they show that although the association between accruals and contemporaneous CFO is strongly negative for firms with positive cash flows (consistent with the 'noise reduction' role documented in DD), the association is much weaker for firms with negative cash flows (consistent with the 'loss recognition role' of accruals and the use of CFO as a proxy for economic performance).

In this paper, we focus on the association between accruals and *long-term nonfinancial* assets and liabilities because they play a central role in the articulation of cash flows and accruals. Long-term nonfinancial assets include all noncurrent assets except investments and are composed of net PP&E (*PPENT*; all variables are defined in Appendix A) and other long-term nonfinancial assets (*ONA*). Other long-term nonfinancial liabilities (*ONL*) include all noncurrent liabilities except long-term debt.[8] We do not focus on *financial instruments* such as investments and debt because

---

7 Furthermore, in a given industry, there are likely significant commonalities in the ratio of depreciation expense to PP&E (whether gross or net). Indeed, Jones (1991) uses the cumulative historical cost of fixed assets as a determinant of accruals, and almost all recent uses of accrual models are on an industry-year basis.

8 In empirical tests, *ONA* (*ONL*) can still contain long-term financial assets (liabilities) that are not classified as investments (long-term debt). We downloaded 10-Ks and reviewed the balance sheet composition for a random sample of 50 observations in the top decile of *ONA* (*ONL*). On average, financial instruments represent 0.4% (2.6%) of *ONA* (*ONL*). The only relatively common financial assets (liabilities) are restricted cash (contingent liabilities and derivatives). To the extent that financial instruments are not systematically associated with accruals, their inclusion in our empirical proxy for *ONA* (*ONL*) will understate the true association.

those are either not associated with accruals in a predictable manner, or the association is very different than for other accounts.[9] We also do not consider *current* assets and liabilities because the underlying accruals are already modeled in the DD model through their association with CFO.

Our decomposition of assets and liabilities into categories bears similarities with Richardson et al. (2005), who assign non-cash assets and liabilities to one of three categories based on the nature of the underlying business activity (current operating, non-current operating, or financial). Our definition for *ONA* (*ONL*) closely matches their definition of NCOA (NCOL), non-current operating assets (liabilities).[10] However, the object of study is different. Richardson et al. (2005) show that *net increases* in NCOA reduce earnings persistence, consistent with the argument that the high subjectivity embedded in long-term operating assets increases the proportion of transitory elements in accounting earnings (i.e., adjustments unassociated with earnings of prior or future periods). In the context of our study, this suggests that the association between total accruals and long-term nonfinancial assets and liabilities is likely to be unstable. For example, years with large impairment losses are followed by years without any impairment. To improve model specification, there is thus an incentive to identify factors that moderate this unstable association. We believe that this provides us with a natural justification to examine the role played by conservatism in the determination of accruals. In other words, even though accruals associated with long-term nonfinancial assets may lack persistence, their occurrence may still be inferred from the existence of unfavorable economic circumstances.

2.4. Models and hypotheses

We test our proposed improvements against the following benchmark model:

$$TOTACC_t = \alpha_1 + \beta_1(1/AT_{avg}) + \beta_2 CFO_{t-1} + \beta_3 CFO_t + \beta_4 DCF_t + \beta_5 DCF_t{*}CFO_t$$

---

9 Debt investments and long-term debt liabilities generate few accruals except for the relatively minor amortization of premiums/discounts and interest receivable. Equity investments can generate accruals (e.g., changes in fair value) but these are considerably more difficult to model, as the same current-year accrual is simultaneously associated with both past and future cash flows from investments.

10 There is no notable difference between *ONL* and NCOL. Regarding *ONA* and NCOA, other than the separate treatment of *PPENT* in our models, the only difference relates to equity method investments, which are included in NCOA but excluded from *ONA*. We do so because the dynamics of the association between equity investments and earnings are radically different than those of PP&E or intangibles. For example, equity method investments are not systematically depreciated or amortized, and if the affiliate is profitable, then the existing asset balance will be positively associated with total accruals.

$$+ \beta_6 CFO_{t+1} + \beta_7 \Delta SALE_t + \beta_8 PPENT_{t-1} + \beta_9 LASSETS_t + \beta_{10} BM_t$$

$$+ \beta_{11} OPSHOCK_t + \beta_{12} BIG4_t + [Year\ and\ industry\ fixed\ effects] + \varepsilon_t \quad (3)$$

The dependent variable in Eq. (3) is total accruals ($TOTACC_t$, the difference between earnings before extraordinary items and *CFO*). The first eight regressors are accrual determinants from Jones (1991), DD and Ball and Shivakumar (2006) and include an intercept scaled by average total assets over years *t-1* and *t* (AT_{avg}), lagged, contemporaneous and one-year-ahead cash flows from operations (CFO_{t-1}, CFO_t and CFO_{t+1}), a 'bad news' indicator for negative cash flows from operations and an interaction term with cash flows (DCF_t and DCF_t*CFO_t), sales growth ex-receivables ($\Delta SALE_t$) and the beginning-of-year net carrying value of fixed assets ($PPENT_{t-1}$).[11] All of the aforementioned determinants are scaled by average total assets. Consistent with prior research, we include four additional control variables: firm size ($LASSETS_t$; e.g., Ecker et al., 2013)[12], the book-to-market ratio (BM_t; e.g., Larcker & Richardson, 2004), an indicator for operating shocks ($OPSHOCK_t$; e.g., Owens et al., 2017)[13] and an indicator for a Big N auditor ($BIG4_t$; e.g., DeFond et al., 2016). Finally, control variables include year and industry (2-digit SIC) fixed effects.[14]

[11] For consistency with ONA_{t-1} and ONL_{t-1}, we use this definition instead of the usual (unamortized) historical cost at the end of the current year ($PPEGT_t$). In firm-specific regressions, $PPENT_{t-1}$ will result in better (worse) specification than $PPEGT_t$ when the double-declining balance (linear) method is used for fixed asset depreciation, but it is unclear whether this translates to greater explanatory power in a cross-sectional setting. In particular, a firm may have a lower depreciation expense than implied by cumulative historical cost if more of its assets have already been entirely depreciated (Curtis et al., 2015) or if it recorded asset impairment losses in the past. In addition, impairment losses are a function of net carrying value, not the original cost. All results reported in this paper are qualitatively unaffected by the proxy for fixed assets.

[12] The inclusion of $LASSETS_t$ can seem redundant because $1/AT_{avg}$ already reflects size. However, both variables are often significant in empirical tests, suggesting that the association between firm size and total accruals is nonlinear. Results regarding our variables of interest are not sensitive to the exclusion of either one of these variables.

[13] We set $OPSHOCK_t$=1 if the underlying firm had a major merger during the year (Compustat *COMPST* code '*AB*'), changed its 4-digit SIC code, or reported discontinued operations or a restructuring charge greater than 5% of sales. As opposed to Owens et al. (2017), we exclude large special items from our definition because many special items are accruals themselves (e.g., goodwill impairment, asset write-downs) and are determined simultaneously with accruals (i.e., the association is mechanical). In this paper, results on the variables of interest are not qualitatively sensitive to the definition of operating shocks but the magnitude of the coefficient on $OPSHOCK_t$ itself is smaller when the definition avoids this mechanical association.

[14] In our main empirical results in section 3, for expositional simplicity, we estimate a pooled regression instead of industry-year regressions. This also facilitates the assessment of the explanatory power of additional variables. Simulation results (also in section 3) are based on industry-year regressions, and the Online Appendix reports results from industry-level analysis (see section 4.3).

To examine whether beginning-of-year long-term other nonfinancial assets and liabilities are useful explanatory variables for total accruals, we estimate the following augmented model:

$$TOTACC_t = \alpha_1 + [Eq.\ (3)\ variables] + \beta_{13}ONA_{t-1} + \beta_{14}ONL_{t-1} + \varepsilon_t \quad (4)$$

Eq. (4) includes all independent variables in Eq. (3) as controls and adds two variables: lagged other long-term nonfinancial assets (ONA_{t-1}) and lagged other long-term nonfinancial liabilities (ONL_{t-1}). Both variables are scaled by AT_{avg}; results are not sensitive to the choice of deflator.

As developed in section 2.3 and in Appendix B, we expect the coefficient on ONA_{t-1} to be negative because several of its components (capitalized intangibles, long-term deferred charges) have to be amortized over relatively short periods, and a prerequisite for impairment losses is the presence of assets recognized on the balance sheet. Likewise, we expect the coefficient on ONL_{t-1} to be positive because this category mostly contains long-term deferred liabilities that eventually reverse to earnings (e.g., deferred taxes, unearned revenue). We formalize these expectations with the following hypotheses :

H1: Total accruals are negatively associated with beginning-of-year other long-term nonfinancial assets.

H2: Total accruals are positively associated with beginning-of-year other long-term nonfinancial liabilities.

Although long-term nonfinancial balance sheet accounts are mechanically associated with accruals in general, the association is likely stronger in ‘bad’ economic states. For example, impairment tests for fixed assets and intangibles with a definite useful life are only performed when unfavorable economic circumstances exist. Goodwill and deferred tax assets (both included in ONA_{t-1}) are also likely affected by contemporaneous economic conditions and as a result, impairment losses are more likely to be recorded when economic news are bad (Banker et al., 2017). In turn, this often triggers a decrease in deferred tax liabilities because impairment losses cause changes in the book-tax differences of long-term assets.[15]

[15] Given that many assets can be depreciated quickly for tax purposes, firms with large fixed assets or intangibles often have large deferred tax liabilities. An impairment generally does not affect the asset’s tax basis but reduces the difference between its net carrying value and its tax basis, leading to a reduction in the deferred tax liability.

Hence, while Ball and Shivakumar (2006) argue that a consequence of conservatism is nonlinearity in the association between *TOTACC* and *CFO*, we argue that another consequence of conservatism is nonlinearity in the association between *TOTACC* and long-term nonfinancial balance sheet accounts: a greater proportion of the beginning-of-year balance of these accounts is 'transferred' to earnings when economic circumstances are unfavorable. To model this, we adapt Eq. (4) by adding interaction terms[16] between the bad news indicator DCF_t and the long-term balance sheet variables for the *full model* :

$$TOTACC_t = \alpha_1 + [Eq.\ (4)\ variables] + \beta_{15} DCF_t{*}PPENT_{t-1} + \beta_{16} DCF_t{*}ONA_{t-1} + \beta_{17} DCF_t{*}ONL_{t-1} + \varepsilon_t \quad (5)$$

We expect the coefficients on these new interaction terms to be in the same direction as the coefficients on the main effects ($PPENT_{t-1}$, ONA_{t-1}, ONL_{t-1}). The coefficient on fixed assets and ONA (β_{15} and β_{16}) should be negative because impairment losses are more likely in poor economic states; deferred tax assets also have a greater probability of write-downs because poor economic forecasts make the realization of tax carryforwards less likely. The coefficient on ONL (β_{17}) should be positive because asset impairments reduce deferred tax liabilities. This discussion yields the following hypotheses :

H3: Total accruals are more negatively associated with beginning-of-year fixed assets when economic conditions are unfavorable.

H4: Total accruals are more negatively associated with beginning-of-year long-term other nonfinancial assets when economic conditions are unfavorable.

H5: Total accruals are more positively associated with beginning-of-year long-term other nonfinancial liabilities when economic conditions are unfavorable.

[16] The addition of variables to the regression model reduces the number of degrees of freedom, which could be problematic when the model is estimated at a relatively 'low' (i.e., specific) industry level. We do not view this drawback as severe because recent research has devised methods to identify peer firms according to factors other than industry membership (e.g., Ecker et al., 2013; Srivastava, 2019) and we contend that the gain from model specification more than offsets the loss in homogeneity arising from more general industry definitions (e.g., moving from 3-digit to 2-digit SIC, or from 2-digit SIC to 12- or 20-industry classifications).

3. Results

3.1. *Sample*

In order to motivate the inclusion of ONA and ONL as determinants of total accruals, we first report the evolution of balance sheet categories over several decades. This longitudinal approach is in the spirit of Givoly and Hayn (2000) and Srivastava (2014). The main idea is that the accrual generating process of the average firm has been significantly altered as a consequence of changes in the economy and accounting standards. The data for this section includes all firms based in the U.S. that are included in Compustat North America, except those in the financial sector. Minimal screens were applied, resulting in 236,243 firm-year observations for the 1963-2019 period.[17]

To formally estimate the models and hypotheses, we require statement of cash flows data to calculate total accruals (*TOTACC*) and nonmissing data for the most complete model (Eq. (5)). As detailed in Table 2, the final sample for accrual model estimation includes 120,319 firm-year observations for the 1988-2019 period.

[INSERT TABLE 2]

3.2. *Evolution of balance sheet accounts*

Table 3 reports sample means for five subperiods for various balance sheet account categories.[18] To identify trends, we regress the yearly sample mean on a time trend (t = year minus 1963); the resulting coefficient on t is the average yearly change in the sample mean. The results show that a typical balance sheet looked very different in the 2010s than it did in the 1960s. First, noncash working capital assets (*WCAPA*) and long-term fixed assets (*PPENT*) decreased significantly, from 45.8% to 24.2% of total assets for *WCAPA* and from 37.1% to 29.0% for *PPENT*, with the decline accelerating in the 1988-2019 subperiod. Analysis of separate *WCAPA* components (untabulated) shows that both receivables and inventory decreased significantly.

[INSERT TABLE 3]

---

[17] We exclude observations with *SIC* between 6000 and 6999 or missing, *FIC* not 'USA', average total assets (AT_{avg}) missing or below $10 million (e.g., Green et al., 2022), missing data to articulate broad categories of balance sheet and, after 1987, statement of cash flows accounts.

[18] For this analysis, all variables are scaled by year-end total assets, multiplied by 100 (so that they represent a percentage of total assets), and winsorized at the 1st and 99th percentiles.

Turning to other asset types, the largest increase is the explosion of long-term other nonfinancial assets (*ONA*), which increased from 4.8% (1963-77) to 22.4% (2008-19) of assets on average, a change essentially realized in the second half of the sample period and mostly due to the increase in capitalized intangibles (untabulated), from 2.7% (1963-77) to 17.8% (2008-19). This result is related to but different from Srivastava (2014), who identifies intangibles as a driver of the decline in earnings quality over time but who uses SG&A expenses as a proxy for intangibles. *Capitalized* intangibles have a direct effect on accruals through amortization and impairment losses.[19] Finally, cash and short-term investments increased significantly (8.7% to 21.4%), consistent with the theory that firms respond to greater fundamental risk by increasing cash holdings (Opler et al., 1999; Bates et al., 2009).[20]

The average composition of balance sheet liabilities changed in smaller orders of magnitude but there are still implications for accruals. The most significant variation is the increase in long-term other nonfinancial liabilities (*ONL*) from 3.2% (1963-77) to 9.1% (2008-19). Most of this increase (untabulated) is driven by accounts classified as other liabilities (*LO*).[21] The relative importance of other liability categories remained stable after the 1960s except for a reduction in short-term debt, in line with the declining need to finance noncash working capital assets.

To summarize, balance sheet accounts associated with accruals modeled by traditional accrual models (Jones, 1991; DD) significantly declined in importance, while long-term other nonfinancial assets and liabilities increased. The last two rows of Table 3 illustrate this: the ratio of *ONA* (*ONL*) to total nonfinancial assets (liabilities) increased from 5.7% to 28.9% (15.5% to 30.9%) in the sample period, an average yearly increase of 0.576% (0.331%; see the column labeled *Trend 1963-2019*). Subperiod analysis in the last two columns of Table 3 show that as a

---

[19] A non-negligible part of the increase in capitalized intangibles is due to the mandatory use of purchase accounting for mergers and acquisitions (SFAS 141 in 2001) but other intangibles have increased as well. Compustat did not report goodwill (*GDWL*) and other intangibles (*INTANO*) separately before 1989 and there are many missing values until 2002. Even for the 2008-19 period, *GDWL* and *INTANO* are more frequently missing than any other main balance sheet category; when both are present, goodwill (other intangibles) is 11.1% (7.0%) of assets on average, and other intangibles are increasing more quickly than goodwill.

[20] Industries with the highest cash holdings are also among the industries with the highest earnings volatility in Srivastava (2014): Pharmaceuticals, Business services, Medical equipment and Computers.

[21] Compustat does not maintain a detailed breakdown of other liabilities but the increase in recent years may have been partially driven by the adoption of SFAS 158 (2006), which mandated the balance sheet recognition of the funded status of defined benefit pension plans (Yu, 2013). However, long-term deferred revenues and provisions (e.g., frequent flyer liabilities, asset retirement obligations) likely also played a role.

percentage of nonfinancial assets, *ONA* grew at a much slower rate during the 1963-1987 period (0.1% per year) than during the 1988-2019 period (0.691%). Coupled with the relative decline in the importance and cross-sectional volatility of traditional accruals (see figures 1 and 2), it is not surprising that the explanatory power of traditional models declined, as they were not designed to take into account accruals that have gained importance.[22]

3.3. Main results: Accruals and long-term nonfinancial assets and liabilities

To show the relevance of long-term other nonfinancial assets and liabilities, we compare results from the pooled estimation of the benchmark, augmented and full models (Eq. (3) to (5)).[23] Table 4 reports the results. Coefficients in the benchmark model are consistent with prior literature, and its *Adjusted* R^2 is 0.2227. Regarding the augmented model, consistent with H1, the coefficient on ONA_{t-1} is negative and significant at the 1% level (-0.1403, t-stat = 38.2). This coefficient is not statistically different than that on $PPENT_{t-1}$ (-0.1357; difference in coefficients untabulated), indicating that on average, the conversion rate of beginning-of-year ONA into total accruals is similar to that of fixed assets. Results are also consistent with H2, as the coefficient on ONL_{t-1} is positive and significant at the 1% level (0.0853, t-stat = 12.6). This suggests that a part of beginning-of-year long-term other nonfinancial liabilities is systematically recognized as accruals during the year. The Adjusted R^2 of this model is 0.2523. Overall, these results suggest that beginning-of-year long-term other nonfinancial assets and liabilities are systematically associated with accruals.

[INSERT TABLE 4]

Results in the last column of Table 4 relate to hypotheses H3 to H5. First, consistent with H3, the negative and significant coefficient on $DCF_t{*}PPENT_{t-1}$ (-0.0285, t-stat = 4.3) indicates that a greater proportion of beginning-of-year fixed assets is expensed into accruals when current economic performance is poor.[24] Second, consistent with H4, the association between accruals and long-term other nonfinancial assets is stronger when economic news are bad. In particular, the

---

[22] Additional analysis (untabulated) also reveals that the correlation coefficient between *PPENT* and *ONA* is -0.29 and has become more negative over time. As a result, fixed assets are not an effective proxy for other long-term nonfinancial assets.

[23] We consider alternative benchmark models in robustness tests (section 4.3).

[24] In section OA.2 of the Online Appendix, we use additional indicators of poor performance (also see section 4.3).

coefficient on *ONA_{t-1}* goes from -0.0929 in good times to (-0.0929 + -0.1712 =) -0.2641 in bad times, a direct consequence of more frequent asset impairments when economic circumstances are unfavorable. In other words, on average, over 25% of *ONA_{t-1}* are converted to earnings as negative accruals when firms have negative cash flows. Models ignoring these results implicitly assume that asset write-downs are entirely discretionary, and many studies interpret *absolute* abnormal accruals as a measure of quality (e.g., Cameran et al., 2015; Bills et al., 2016), leading to the risky proposition that firm-years with large asset impairment losses have lower quality.[25] Third, consistent with H5, the positive association between accruals and long-term other nonfinancial liabilities, which is 0.0525 for firms with positive cash flows from operations, is higher for firms with negative cash flows from operations, at 0.1538 (0.0525 + 0.1013). As discussed in section 2.4, part of this effect may be due to the fact that deferred tax liabilities, an important component of *ONL_{t-1}*, move in the opposite direction of long-term assets when the latter are impaired.

A comparison of the three sets of results in Table 4 yields another insight regarding the potential implications of including ONA and ONL in the model. There has long been considerable debate regarding the effect of Big N auditors on financial reporting quality, and part of the debate has been focused on methodology (e.g., Lawrence et al., 2011; DeFond et al., 2016). Like any other variable, the estimated effect of a Big N audit is affected by model specification. In Table 4, the coefficient on *BIG4* is -0.0041 in the benchmark model, -0.0058 in the augmented model and -0.0075 in the full model. These negative and significant coefficients suggest that companies with Big N auditors report lower total accruals and can therefore be seen as more conservative. However, the magnitude of this effect is much more pronounced when ONA and ONL are considered. For example, results from the full model suggest that companies with Big N auditors have discretionary accruals that are 0.75% of total assets lower than companies with non-Big N auditors, while the comparable figure for the benchmark model is only 0.41%.[26] Overall, Table 4 suggests that there is a significant association between accruals and long-term nonfinancial assets and liabilities for both cash-flow-positive and cash-flow-negative firms, and that omission of these

---

[25] Large impairment losses can of course be a *consequence* of poor accounting quality if asset balances were overstated in the past.

[26] As discussed in Lawrence et al. (2011) and DeFond et al. (2016), due to selection bias, Big N auditors cannot be inferred to be the direct cause of this effect.

variables can potentially affect the interpretation of other coefficients researchers may be interested in, and wrongly detect abnormal accruals.

3.4. Simulation results

In this section, we perform tests on simulated data in order to determine whether ONA and ONL improve the model's ability to detect discretionary accruals. As in prior research (e.g., Dechow et al., 1995; Ecker et al., 2013; McMullin & Schonberger, 2020), we artificially seed abnormal accruals in our data and compare the ability of the benchmark, augmented and full models to detect the manipulation.

To produce our simulated data, we repeat the following steps 50,000 times:

1. From the full sample, we randomly pick an 'event' observation to be manipulated and choose all other observations in the same industry and fiscal year as controls.
2. As in Ecker et al. (2013), we increase the event observation's total accruals by 2% to 20% of total assets in 2% increments.
3. We estimate the benchmark, augmented and full models for each 'seed level' (i.e., from 0% 'as-reported', 2%, 4% and so on, up to 20%).[27]
4. For each model and each seed level, we regress the residuals from the previous stage on an 'event' indicator (i.e., a binary variable equal to one for the event observation and zero for all other firms in the same industry-year).
5. For each model and each seed level, we tabulate the percentage of simulations in which the 'event' indicator is positive and significant at the 10% level; we call this percentage the detection rate.[28] As in Ecker et al. (2013), the interpretation is that a better-specified model should be more likely to detect artificial increases in total accruals.

In Table 5, columns (1) to (3) report detection rates for all 50,000 simulations. The results show that the augmented and full models have higher detection rates than the benchmark model, even at relatively low seed levels. For example, when total accruals are artificially increased by 6%,

---

[27] Although Table 5 is based on the nonlinear model (Eq. (3) to (5)), results (untabulated) are qualitatively similar with the Modified Jones model.

[28] Results (untabulated) are qualitatively similar if the event indicator is directly included in the estimation model (i.e., step 3).

discretionary accruals derived from the benchmark (augmented; full) model are significantly positive for 10.6% (11.2%; 12.0%) of simulations. Given that detection rates at the 0% (baseline) seed level are similar across models, the higher detection rates of the augmented and full models at higher manipulation levels are not the result of a higher proportion of Type I errors (e.g., Kothari et al., 2005).

[INSERT TABLE 5]

Columns (4) to (6) of Table 5 show detection rates for firms in the top 25% of ONA. We separately examine model performance for high-ONA firms because the benchmark model does not consider intangibles and other ONA components that generate negative accruals (e.g., amortization). This could systematically understate discretionary accruals for high-ONA firms and therefore reduce the benchmark model's ability to detect income-increasing accrual management. The augmented and full models are less likely to suffer from this issue given that they include ONA_{t-1} as a regressor. Indeed, differences in detection rates are much larger for this subset of firms: at the 6% seed level, the detection rate of the full model is 10.9%, compared to only 6.3% for the benchmark model.[29] To summarize, Table 5 shows that the augmented and full models are more likely to successfully detect income-increasing accrual manipulation, especially for firms with high ONA. Given that intangibles and other long-term nonfinancial assets have become more important over time, we interpret these results as evidence that the model specification is improved when ONA and ONL are included as accrual determinants.

4. Additional results

4.1. Components of total accruals

Almost all listed firms in the U.S. use the indirect method to calculate cash flows from operations (Krishnan & Largay, 2000; Orpurt & Zang, 2009) and therefore provide several line items that can

[29] Stated differently, while the benchmark model's detection rate is significantly lower for high-ONA observations than others (i.e., figures in column (4) are lower than in column (1) at all seed levels), the augmented and full models' detection rates are much more similar across firm types, and this is due to improvements for high-ONA observations.

be used to break down total accruals into more granular components. We use the following breakdown to examine how ONA_{t-1} and ONL_{t-1} are associated with accruals:

$$TOTACC = WCACC + DEPACC + OTHACC \tag{6}$$

Our breakdown assigns individual line items to one of three categories: working capital accruals (*WCACC*), depreciation and amortization (*DEPACC*), and other accruals (*OTHACC*). We conjecture that other long-term nonfinancial assets and liabilities are strongly associated with *OTHACC* and *DEPACC* – as the amortization of some intangibles is predictable – and are only marginally associated with working capital accruals (*WCACC*).[30]

To explore this conjecture, we separately estimate the full model, with each component of total accruals as the dependent variable. Table 6 shows the results; for comparative purposes, the Adjusted R^2 of the benchmark model is presented at the bottom of the table. The second-to-last row shows that the explanatory power of the benchmark model is significantly higher for working capital accruals (*WCACC*) (Adjusted R^2 of 0.3093) and depreciation (*DEPACC*) (0.2856) than for other accruals (*OTHACC*) (0.0967). As expected, the increase in explanatory power of the full model is much larger for depreciation (0.3294 – 0.2856 = 0.0438) and other accruals (0.1260 – 0.0967 = 0.0293) than for working capital accruals (0.3139 – 0.3093 = 0.0046).

[INSERT TABLE 6]

Table 6 also shows that ONA_{t-1} is negatively associated with each component and that ONL_{t-1} is positively associated with both *DEPACC* and *OTHACC*. Furthermore, the magnitude of the association is strongest when *OTHACC* is the dependent variable. As for the interaction terms between DCF_t and $PPENT_{t-1}$, ONA_{t-1} and ONL_{t-1}, they generally take the predicted signs and indicate a stronger association between beginning-of-year balance sheet items and accruals when economic conditions are unfavorable. Interestingly, when *OTHACC* is the dependent variable, the magnitude of the negative coefficient on DCF_t*ONA_{t-1} (-0.0969) is much greater than that on

30 Because our breakdown is dependent on Compustat data and there is substantial cross-sectional variation in how firms report accruals in the statement of cash flows, *ONA* and *ONL* can still be associated with *WCACC* in empirical tests. An example is pension adjustments. When firms detail such adjustments over multiple line items in the statement of cash flows, Compustat will typically include these adjustments in Funds from Operations – Other (*FOPO*), a constituent of *OTHACC* that also includes impairment losses. However, when firms combine these adjustments with 'other items', they will be included in Assets and liabilities – Other (Net Change) (*AOLOCH*), a component of *WCACC* that includes variations in current deferred expenses and sometimes accrued liabilities.

$DCF_t*PPENT_{t-1}$ (-0.0041).[31] In other words, in order to explain accruals such as impairment losses, it is particularly important to account for the prior existence of long-term other nonfinancial assets to be impaired.

Another result warrants further discussion: beginning-of-year fixed assets ($PPENT_{t-1}$) and long-term other nonfinancial assets (ONA_{t-1}) are negatively associated with *working capital* accruals, especially when CFO_t is negative. Separate analysis of *WCACC* subcomponents (untabulated) suggests that both variables are negatively associated with changes in accounts receivable and inventory in bad economic times. Fazzari and Petersen (1993) argue that financially constrained firms temporarily under-invest in working capital to maintain a stable fixed-investment path; this strategy may be more prevalent for firms whose relatively higher (long-term) capital intensity necessitates greater current-year reinvestments.[32] To summarize, the full model's superior ability to explain total accruals is mainly due to the association between long-term other nonfinancial assets and liabilities and other accruals, but also because ONA_{t-1} is significantly associated with depreciation as *DEPACC* includes the amortization of intangibles with a finite useful life.

4.2. Components of long-term other nonfinancial assets and liabilities

In this subsection, we examine ONA and ONL components by replacing ONA_{t-1} with intangibles ($INTAN_{t-1}$) and other assets (AO_{t-1}), while ONL_{t-1} is replaced by deferred tax liabilities ($TXDITC_{t-1}$) and other liabilities (LO_{t-1}). This decomposition intends to trade off parsimony with improved specification, as the coefficients of individual components may vary.

Table 7 presents results from estimating the augmented and full models. Results show that intangibles (which include goodwill) and other assets are both strongly (negatively) associated with total accruals. On the liability side of the ledger, in the augmented model, the coefficient on $TXDITC_{t-1}$ is 0.1657, indicating that on average, around 16.5% of beginning-of-year deferred tax liabilities are converted into accruals every year. Other liabilities are also positively associated

---

[31] Nevertheless, separate analysis of *OTHACC* subcomponents (untabulated) reveals a reliably negative association between $DCF_t*PPENT_{t-1}$ and *FOPO*, the Compustat item containing impairment losses.

[32] As discussed earlier, an alternative explanation is that some accruals associated with fixed assets and ONA are included in the Compustat variables that we include in our definition of *WCACC*.

with accruals but to a lesser degree. Results for the full model are similar to what they were before. In particular, the coefficients on intangibles and on other assets are both negative when the firm is generating positive cash flows, but the association is stronger (more negative) for firms with negative cash flows. We conclude that the best results are achieved when the model integrates the implications of conservatism for the association between accruals and long-term nonfinancial assets and liabilities.[33]

[INSERT TABLE 7]

4.3. Other tests

In this section, we briefly discuss additional results that are detailed in the Online Appendix and robustness tests. In section OA.1 of the Online Appendix (*Industry analysis*), we show that the results in Table 4 hold across most industries. Furthermore, the benefit from including beginning-of-year ONA and ONL as determinants of total accruals is the highest in industries that have become more important over time or in which capitalized intangibles are more significant.

In section OA.2 (*Poor performance indicators*), we examine the ability of six 'bad news' proxies to moderate the association between total accruals and long-term nonfinancial assets and liabilities: negative cash flows, negative returns, negative year-over-year changes in cash flows, employees and cash sales, and large restructurings. The idea behind this approach is that multiple economic factors can affect conservative accounting decisions such as asset write-downs. Using an extension of Eq. (5) that includes all six indicators and interaction terms between each indicator and $PPENT_{t-1}$, ONA_{t-1} and ONL_{t-1}, we show that each indicator has incremental explanatory power, consistent with the argument that conditional conservatism has multiple dimensions found in empirical data (Byzalov & Basu, 2016; Banker et al., 2017), with negative cash flows (DCF_t) being the most important proxy.

In section OA.3 (*Illustration: Past mergers and accruals*), we show that the number of mergers in the past five years is negatively associated with total accruals when control variables only include variables in the benchmark model, but that the association is not significant when

[33] Untabulated results from a more detailed breakdown of intangibles in the full model show significantly negative coefficients for goodwill and other intangibles, both for the main effects ($GDWL_{t-1}$: -0.0827; $INTANO_{t-1}$: -0.1025) and for the incremental bad news effect (DCF_t*$GDWL_{t-1}$: -0.1724; DCF_t*$INTANO_{t-1}$: -0.1826).

beginning-of-year ONA and ONL are included as additional controls. This simple illustration demonstrates the importance of including the latter as explanatory variables in accrual models.

Finally, in section OA.4 (*Variable importance tests*), we discuss three statistics recommended by Johannesson et al. (2023) to measure whether our variables of interest have a material (economic) effect on accruals. The results indicate that ONA has a material effect on total accruals and its components; although ONL has a smaller effect on total accruals, it is materially associated with other accruals (*OTHACC*), the accrual component for which existing models have the lowest explanatory power.

We also conduct a number of additional and robustness tests. First, we estimate yearly regressions of the full model (Eq. (5) without year fixed effects) in order to examine the time series evolution of the coefficients on long-term nonfinancial balance sheet accounts ($PPENT_{t-1}$, ONA_{t-1} and ONL_{t-1}) and the associated interaction terms. Results (untabulated) show that $PPENT_{t-1}$, ONA_{t-1}, $DCF_t*PPENT_{t-1}$ and DCF_t*ONA_{t-1} are consistently negatively associated with total accruals. Among other things, the negative association between ONA_{t-1} and total accruals is not restricted to years in which the U.S. economy experienced significant downturns (e.g., 2001 and 2008). As for the association between ONL_{t-1} and accruals, it has been more unstable over time but has been positive for most years and has generally been more important for firms with negative cash flows. To summarize, the association between long-term nonfinancial assets and accruals documented in Table 4 has remained significant throughout the sample period, especially during challenging economic times (firm-specific or market-wide); this applies to both tangible and intangible assets.

Second, to examine whether our main insight regarding the usefulness of ONA and ONL generalizes to accrual models other than Eq. (3), we add ONA_{t-1} and ONL_{t-1} as regressors in the modified Jones model (Dechow et al., 1995) and two 'performance-adjusted' models, which consist in adding lagged or contemporaneous return on assets to the modified Jones model (Kothari et al., 2005). The results (untabulated) are qualitatively similar to the augmented model reported in Table 4: the coefficient on ONA_{t-1} (ONL_{t-1}) is consistently negative (positive) and significant.[34]

---

[34] The model that includes ROA_t as a regressor has a higher explanatory power overall, but this is obtained mechanically because the dependent variable ($TOTACC_t$) is a component of ROA_t.

We conclude that the inclusion of ONA_{t-1} and ONL_{t-1} can improve the specification of all popular accrual models.

Third, in Eq. (4) and (5), we replace $PPENT_{t-1}$, ONA_{t-1} and ONL_{t-1} with $PPENT_t$, ONA_t and ONL_t to assess whether contemporaneous long-term nonfinancial assets and liabilities are superior to their lagged values at explaining total accruals. The results (untabulated) show a decrease in adjusted R^2 for both models (for example, in the full model, the adjusted R^2 is 0.2257 instead of 0.2619). The coefficients on $PPENT_t$, ONA_t, $DCF_t*PPENT_t$ and DCF_t*ONA_t keep the same sign as in Table 4 but their magnitude is lower (i.e., closer to zero). These results are consistent with a confounding effect: as opposed to lagged values of these balance sheet accounts, contemporaneous values have different components that are associated with accruals in opposite directions, leading to model misspecification.[35] We conclude that the true economic association between contemporaneous accruals and long-term nonfinancial balance sheet accounts is most likely to be modeled by including lagged values rather than contemporaneous values.

Finally, Owens et al. (2017) argue that idiosyncratic shocks such as reorganizations, mergers or other operating shocks affect accruals over multiple periods. As an additional regressor, we follow Owens et al. (2017) and add the mean squared residuals from firm-specific regressions of the firm's monthly stock return on market and industry returns for the 24 months ending at the fiscal year-end date. Results (untabulated) are qualitatively similar to those reported in Table 4 despite a reliably negative association between total accruals and idiosyncratic shocks; we conclude that our results are unaffected by the inclusion of idiosyncratic shocks.

5. Conclusion

Prior research has called for more studies on the economic determinants of accounting accruals (e.g., Dechow et al., 2010) and has criticized the large magnitude of abnormal accruals (e.g.,

[35] Take fixed assets as an example. Ignoring sales of existing PPE, we have: $PPENT_t = PPENT_{t-1} + PPE\_ACQ_t + DP_t$, where PPE_ACQ_t is PPE acquisitions during the year (a positive number) and DP_t is depreciation and impairment (a negative number). We can then consider the following unconstrained model: $TOTACC_t = \alpha + \beta_1 PPENT_{t-1} + \beta_2 PPE\_ACQ_t + \beta_3 DP_t + \varepsilon$, along with the constrained model $TOTACC_t = \alpha + \beta PPENT_t + \varepsilon$ which is equivalent to forcing $\beta_1=\beta_2=\beta_3$. In the unconstrained model, $\beta_1<0$ and $\beta_2<0$ because asset balances generate negative accruals through depreciation or impairment, but $\beta_3>0$ because DP_t is itself an accrual (in fact, if depreciation was the only accrual, we would have $\beta_3=1$). Clearly, the constrained model is misspecified as $PPENT_t$ combines components that have an opposite effect on accruals.

Bernard & Skinner, 1996; Owens et al., 2017). We argue that long-term nonfinancial balance sheet accounts are natural determinants because of the mechanics driving the recognition of accruals, and we show that beginning-of-year long-term other nonfinancial assets (liabilities) are significantly negatively (positively) associated with accruals. We conclude that balance sheet accounts representing net cumulative investments can improve the specification of accrual models. The results also have implications for research on conservatism because in addition to unfavorable economic conditions, capitalized assets are a prerequisite for impairment losses. We emphasize the necessity of renewed efforts to identify economic determinants of accruals, and we show that omission of long-term other nonfinancial assets and liabilities can lead to biased coefficients on other variables of interest and, therefore, incorrect inference.

The most important limitation of this study is inherent to the model, which proposes an increase in the number of explanatory variables as a response to accrual model misspecification. In empirical settings, this could require the enlargement of the number of peer firms (i.e., industry) to enable model estimation, violating the intra-industry homogeneity assumption implicit in cross-sectional industry models (Owens et al., 2017; Srivastava, 2019).

The framework linking cumulative past investments to current-period accruals enables the examination of additional research questions related to determinants of firms' accrual generating processes. For example, the model links past capitalization decisions to current write-downs, as past unconditional conservatism reduces the likelihood and extent of current impairments (Beaver & Ryan, 2005). To the extent that past incentives have affected past accounting decisions (e.g., Shalev et al., 2013), the model could be used to examine to what extent indicators of conditional conservatism (e.g., the conditionally negative association between noncurrent assets and accruals) capture the reversal of prior asset balance overstatements. In addition, although our results show a significant association between long-term nonfinancial assets and accruals, they are based on firms using U.S. GAAP, which severely limit instances in which intangibles can be capitalized. Future research could investigate whether that association is stronger for firms using IFRS, which has less restrictive intangible capitalization criteria.

Declaration of interest statement

The authors report there are no competing interests to declare.

References

Abbott, L., Daugherty, B., Parker, S., & Peters, G. (2016). Internal audit quality and financial reporting quality : The joint importance of independence and competence. *Journal of Accounting Research* 54, 3-40.

Aobdia, D. (2019). Do practitioner assessments agree with academic proxies for audit quality? Evidence from PCAOB and internal inspections. *Journal of Accounting and Economics* 67, 144-174.

Ball, R., & Shivakumar, L. (2006). The role of accruals in asymmetrically timely gain and loss recognition. *Journal of Accounting Research* 44, 207-242.

Banker, R., Basu, S., & Byzalov, D. (2017). Implications of impairment decisions and assets' cash-flow horizons for conservatism research. *The Accounting Review* 92, 41-67.

Bates, T., Kahle, K., & Stulz, R. (2009). Why do U.S. firms hold so much more cash than they used to? *Journal of Finance* 64, 1985-2021.

Beaver, W., & Ryan, S. (2005). Conditional and unconditional conservatism : Concepts and modeling. *Review of Accounting Studies* 10, 269-309.

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

Bernard, V., & Skinner, D. (1996). What motivates managers' choice of discretionary accruals? *Journal of Accounting and Economics* 22, 313-325.

Bills, K., Cunningham, L., & Myers, L. (2016). Small audit firm membership in associations, networks, and alliances : Implications for audit quality and audit fees. *The Accounting Review* 91, 767-792.

Bushman, R., Lerman, A., & Zhang, X. F. (2016). The changing landscape of accrual accounting. *Journal of Accounting Research* 54, 41-77.

Byzalov, D., & Basu, S. (2016). Conditional conservatism and disaggregated bad news indicators in accrual models. *Review of Accounting Studies* 21, 859-897.

Cameran, M., Francis, J. R., Marra, A., & Pettinicchio, A. (2015). Are there adverse consequences of mandatory auditor rotation? Evidence from the Italian experience. *Auditing : A Journal of Practice & Theory* 34 (1), 1-24.

Chen, W., Hribar, P., & Melessa, S. (2018). Incorrect inferences when using residuals as dependent variables. *Journal of Accounting Research* 56, 751-796.

Choudhary, P., Koester, A., & Shevlin, T. (2016). Measure income tax accrual quality. *Review of Accounting Studies* 21, 89-139.

Christensen, T. E., D'Adduzio, J., & Nelson, K. K. (2023). Explaining accruals quality over time. *Journal of Accounting and Economics* 76, 101575.

Curtis, A., Lewis-Western, M., & Toynbee, S. (2015). Historical cost measurement and the use of DuPont analysis by market participants. *Review of Accounting Studies* 20, 1210-1245.

Dechow, P. (1994). Accounting earnings and cash flows as measures of firm performance : The role of accounting accruals. *Journal of Accounting and Economics* 18, 3-42.

Dechow, P., & Dichev, I. (2002). The quality of accruals and earnings : The role of accrual estimation errors. *The Accounting Review* 77 (Supplement), 35-59.

Dechow, P., Ge, W., & Schrand, C. (2010). Understanding earnings quality : A review of the proxies, their determinants and their consequences. *Journal of Accounting and Economics* 50, 344-401.

Dechow, P., Sloan, R., & Sweeney, A. P. (1995). Detecting earnings management. *The Accounting Review* 70, 193-225.

DeFond, M., Erkens, D. H., & Zhang, J. (2016). Do client characteristics really drive the Big N audit quality effect? New evidence from propensity score matching. *Management Science* 63, 3628-3649.

DeFond, M., & Jiambalvo, J. (1994). Debt covenant violation and manipulation of accruals. *Journal of Accounting and Economics* 17, 145-176.

Ecker, F., Francis, J., Olsson, P., & Schipper, K. (2013). Estimation sample selection for discretionary accruals models. *Journal of Accounting and Economics* 56, 190-211.

Efendi, J., Srivastava, A., & Swanson, E. P. (2007). Why do corporate managers misstate financial statements? The role of option compensation and other factors. *Journal of Financial Economics* 85, 667-708.

Fazzari, S., & Petersen, B. (1993). Working capital and fixed investment : New evidence on financing constraints. *The RAND Journal of Economics* 24, 328-342.

Francis, J., LaFond, R., Olsson, P., & Schipper, K. (2005). The market pricing of accruals quality. *Journal of Accounting and Economics* 37, 319-352.

Frankel, R., Jennings, J., & Lee, J. (2016). Using unstructured and qualitative disclosures to explain accruals. *Journal of Accounting and Economics* 62, 209-227.

Givoly, D., & Hayn, C. (2000). The changing time series properties of earnings, cash flows, and accruals : has financial reporting become more conservative? *Journal of Accounting and Economics* 29, 287-320.

Green, J., Louis, H., & Sani, J. (2022). Intangible investments, scaling, and the trend in the accrual-cash flow association. *Journal of Accounting Research* 60, 1551-1582.

Guay, W. R., & Sidhu, B. K. (2001). The usefulness of long-term accruals. *Abacus* 37, 110-131.

Healy, P. 1985. The effect of bonus schemes on accounting decisions. *Journal of Accounting and Economics* 7, 85-107.

Hribar, P., & Collins, D. (2002). Errors in estimating accruals : Implications for empirical research. *Journal of Accounting Research* 40, 105-134.

Johannesson, E., Ohlson, J. A., & Zhai, S. W. (2023). The explanatory power of explanatory variables. *Review of Accounting Studies*, forthcoming.

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

Kothari, S. P., Leone, A., & Wasley, C. (2005). Performance matched discretionary accrual models. *Journal of Accounting and Economics* 39, 163-197.

Krishnan, G., & Largay III, J. (2000). The predictive ability of direct method cash flow information, *Journal of Business Finance & Accounting* 27, 215-245.

Lamoreaux, P. (2016). Does PCAOB inspection access improve audit quality? An examination of foreign firms listed in the United States. *Journal of Accounting and Economics* 61, 313-337.

Larcker, D., & Richardson, S. (2004). Fees paid to audit firms, accrual choices, and corporate governance. *Journal of Accounting Research* 42, 625-658.

Larson, C. R., Sloan, R., & Giedt, J. Z. (2018). Defining, measuring, and modeling accruals: a guide for researchers. *Review of Accounting Studies* 23, 827-871.
Lawrence, A., Minutti-Meza, M., & Zhang, P. (2011). Can Big 4 versus non-Big 4 differences in audit-quality proxies be attributed to client characteristics? *The Accounting Review* 86, 259-286.
McMullin, J. L., & Schonberger, B. (2020). Entropy-balanced accruals. *Review of Accounting Studies* 25, 84-119.
McNichols, M. (2002). The quality of accruals and earnings : The role of accrual estimation errors : Discussion. *The Accounting Review* 77 (Supplement), 61-69.
Opler, T., Pinkowitz, L., Stulz, R., & Williamson, R. (1999). The determinants and implications of corporate cash holdings. *Journal of Financial Economics* 52, 3-46.
Orpurt, S., & Zang, Y. (2009). Do direct cash flow disclosures help predict future operating cash flows and earnings? *The Accounting Review* 84, 893-935.
Owens, E., Wu, J. S., & Zimmerman, J. (2017). Idiosyncratic shocks to firm underlying economics and abnormal accruals. *The Accounting Review* 92, 183-219.
Rayburn, J. (1986). The association of operating cash flow and accruals with security returns. *Journal of Accounting Research* 24 (Supplement), 112-133.
Richardson, S., Sloan, R., Soliman, M., & Tuna, I. (2005). Accrual reliability, earnings persistence and stock prices. *Journal of Accounting and Economics* 39, 437-485.
Shalev, R., Zhang, I. X., & Zhang, Y. (2013). CEO compensation and fair value accounting : Evidence from purchase price allocation. *Journal of Accounting Research* 51, 819-854.
Sloan, R. (1996). Do stock prices fully reflect information in accruals and cash flows about future earnings? *The Accounting Review* 71, 289-315.
Srivastava, A. (2014). Why have measures of earnings quality changed over time? *Journal of Accounting and Economics* 57, 196-217.
Srivastava, A. (2019). Improving the measures of real earnings management. *Review of Accounting Studies* 24, 1277-1316.
Teoh, S. H., Welch, I., & Wong, T. J. (1998). Earnings management and the underperformance of seasoned equity offerings. *Journal of Financial Economics* 50, 63-99.
Xie, H. (2001). The mispricing of abnormal accruals. *The Accounting Review* 76, 357-373.
Yu, K. (2013). Does recognition versus disclosure affect value relevance? Evidence from pension accounting. *The Accounting Review* 88, 1095-1127.

Supplemental Data and Research Materials

Online Appendix for: Accruals and long-term nonfinancial assets and liabilities

Appendix A : Variable definitions

This appendix provides definitions for variables used in empirical tests. All variables not defined in this table are from Compustat and use the same mnemonic as the database when accessed through WRDS. Subscripts indexing year omitted unless necessary.

Variable	**Definition**
Accruals, earnings and cash flows	
AT_{avg}	Average total assets ($AT_{avg} = (AT_t + AT_{t-1})/2$)
CFO	Cash flow from operations excluding discontinued operations divided by AT_{avg}: $CFO = (OANCF – XIDOC)/AT_{avg}$
TOTACC	Total accruals from the statement of cash flows divided by AT_{avg}: $TOTACC = [IBC – (OANCF – XIDOC)]/AT_{avg}$
WCACC	Working capital accruals divided by AT_{avg}: $WCACC = (RECCH + INVCH + TXACH + APALCH + AOLOCH)/AT_{avg}$, missing components set to zero unless all five are missing
DEPACC	Depreciation expense reported on the statement of cash flows divided by AT_{avg}: $DEPACC = DPC*(-1)/AT_{avg}$
TRADACC	Traditional accruals, defined as the sum of working capital accruals and depreciation: *TRADACC* = *WCACC* + *DEPACC*
OTHACC	Other accruals: *OTHACC* = *TOTACC* – *TRADACC*
Balance sheet (all scaled by AT_{avg} except LASSETS)	
LASSETS	Natural logarithm of total assets (*LASSETS* = ln(*AT*))
PPENT	Net property, plant and equipment (cost minus accumulated depreciation)
ONA	Other long-term nonfinancial assets (*ONA* = *AT* – *ACT* – *INVEST* – *PPENT*)
ONL	Other long-term nonfinancial liabilities (*ONL* = *LT* – *LCT* – *DLTT*)
WCAPA	Working capital assets, or current assets minus short-term financial assets (*WCAPA* = *ACT* – *CHE*)
INVEST	Long-term investments (*INVEST* = *IVAEQ* + *IVAO*)
INTAN	Capitalized intangibles including goodwill (as defined by Compustat)
AO	Other assets (as defined by Compustat)
WCAPL	Working capital liabilities, or current liabilities minus short-term debt (*WCAPL* = *LCT* – *DLC*)
TXDITC	Deferred tax liability (as defined by Compustat)
LO	Other liabilities (as defined by Compustat)
Other	
DCF	Indicator equal to one if $CFO<0$, zero otherwise
$\Delta SALE$	Change in sales minus change in accounts receivable ($\Delta SALE = (SALE_t – SALE_{t-1}) – (RECT_t – RECT_{t-1})$)
BM	Book-to-market ratio (*BM* = *CEQ*/(*PRCC_F***CSHO*))
OPSHOCK	Operating shock measure from Owens et al. (2017): indicator equal to one if at least one of the following conditions are met: *COMPST* = "*AB*" ('big' merger), change in 4-digit SIC code, either *DO*, *RCP* or *SPI* are greater than 5% of sales ('big' discontinued operations, restructuring or special items)
BIG4	Indicator equal to one if company has a Big 4 auditor ($1 \le AU \le 8$)

Appendix B : Accrual mechanics

This appendix describes four types of accruals which intend to (1) reduce noise in firm performance (earnings) by mechanically transferring cash flows to the 'correct' period and (2) record revisions to expected future economic benefits in a timely manner (i.e., Ball and Shivakumar's (2006) 'gain and loss recognition' role), and describes the mechanics associated with the three most important types. The general idea is to extend DD beyond working capital accruals and illustrate how the balance sheet mitigates some tractability issues arising from the inclusion of long-term accruals. We decompose total accruals into four categories based on their association with cash flow components (*CFO*, *CFI* or *CFF*) and their expected resolution date :

a) Working capital accruals (*WCACC*) are related to *recent* past, current, or *near* future *CFO* (DD) and include changes in noncash current assets and nondebt current liabilities except those arising through business combinations and discontinued operations. Any individual accrual in this category will either reverse in the future or is the reversal of a past accrual.
b) Investment-related accruals (*INVACC*) are related to past and future *CFI* and include depreciation (*DEPACC*), amortization and impairment of PP&E and intangibles, goodwill impairment and gains and losses on the sale of productive assets. Contrary to categories associated with *CFO*, accruals from this category typically do not reverse.
c) Long-term operating accruals (*LTOACC*) are related to *distant* past or future *CFO* and include deferred taxes, pensions, asset retirement obligations, noncurrent deferred revenues, and similar items. As with *WCACC*, any individual accrual in this category is eventually reversed, but the longer horizon creates substantial measurement error (e.g., pension assumptions), with regular adjustments in intermediate periods.
d) Financing-related accruals (*FINACC*) are related to past and future *CFF* and typically include few items : gains and losses on debt extinguishment or refinancing, amortization of debt issuance costs (if applied against the carrying value of debt) or bond premium/discount. Given their relatively lower importance, we do not model the mechanics or integrate predictors related to *FINACC* in the empirical model.

B.1. Working capital accruals (WCACC)

Prior literature discusses *WCACC* mechanics extensively (Dechow, 1994; DD; Ball & Shivakumar, 2006). This subsection is a summary that is a starting point for modeling other accrual types. DD show that mechanically, *WCACC* are positively associated with past and future *CFO* but negatively associated with current *CFO*; for example, a year *t*-1 cash inventory purchase (negative CFO_{t-1} and positive $WCACC_{t-1}$) is associated with a negative $WCACC_t$ when inventory is transformed into cost of goods sold, and similarly a year *t* credit sale (positive $WCACC_t$) is followed by a year *t*+1 collection (positive CFO_{t+1} and negative $WCACC_{t+1}$). The noise reduction role of accruals is central to this component because a significant proportion of everyday activities is characterized by little uncertainty, although the provision for bad debt and inventory write-downs obviously require estimates. The DD model relates *WCACC* for period *t* to lagged, contemporaneous and one-year-ahead *CFO* :

$$WCACC_t = CFO_{t-1}^{t} - CFO_t^{t-1} - CFO_t^{t+1} + CFO_{t+1}^{t} + \varepsilon_{t+1}^{t} - \varepsilon_t^{t-1} \qquad \text{(B1)}$$

where CFO_i^j is cash flows from operations received or paid in period *i* but recognized in earnings in period *j*, and ε_i^j are estimation error terms. $WCACC_t$ is therefore negatively (positively) correlated with CFO_t (CFO_{t-1} and CFO_{t+1}), but the correlation is not perfect because of estimation errors and because a large portion of CFO_i derives from transactions that originate and are settled in period *i*, not affecting accruals in a mechanical manner.

Ball and Shivakumar (2006) argue that the two roles of accruals have opposite implications for the sign of the correlation between $WCACC_t$ and CFO_t. The reason is that the portion of CFO_t not mechanically associated with accruals measures current performance and should therefore be *positively* associated with current accruals if two conditions are met : (a) CFO_t is positively correlated with future performance (a reasonable assumption), and (b) current accruals reflect year-end estimates of future cash flows. Ball and Shivakumar (2006) then argue that conservative accounting rules imply that condition (b) is only met when economic circumstances are poor (e.g., lower of cost or market inventory valuation rule), leading to the following piecewise linear (nonlinear) model :

$$WCACC_t = \beta_0 + \beta_1 CFO_{t-1} + \beta_2 D_t + \beta_3 CFO_t + \beta_4 D_t * CFO_t + \beta_5 CFO_{t+1} + \varepsilon_t \quad \text{(B2)}$$

where D_t is a binary variable equal to one when economic news are bad. In the model, β_3 (β_1 and β_5) is (are) negative (positive) following DD, and conservatism implies that $\beta_4 > 0$. There are many candidates for D_t; an obvious example is to set $D_t = 1$ when $CFO_t < 0$.

B.2. Investment-related accruals (INVACC)

There are multiple ways to model *INVACC*; we pick a method anchored on beginning-of-year book value to link long-term assets to accruals. A major conceptual distinction between *INVACC* and working capital accruals is that they do not sum to zero over the life of the firm : while all *WCACC* eventually reverse, the sum of *INVACC* over the life of a given asset is never zero unless the purchase price is exactly equal to the ultimate disposition proceeds. This is embedded in the traditional definition of depreciation being the periodic allocation, over the life of an asset, of the difference between its historical cost and its residual value. For a single asset, we have :

$$CFI_{t-k} + CFI_{t+m} = \sum_{i=t-k}^{t+m} INVACC_i \quad \text{(B3)}$$

where CFI_{t-k} is the year *t-k* purchase price (a negative value), CFI_{t+m} is the year *t+m* liquidation price (hereafter « terminal value »), and $INVACC_i$ is the year *i* investment-related accrual (e.g., depreciation expense, impairment loss or write-up if permitted by accounting standards, loss or gain on the sale of the asset if in year *t+m*). The left-hand side is the 'allocation base'. A negative value for $INVACC_i$ is typical and indicates that the terminal value is lower than the purchase price because most productive assets lose value as they are used ($|CFI_{t-k}| > CFI_{t+m}$). We can isolate year *t* accruals on the left-hand side in order to model mechanics at an intermediate period :

$$INVACC_t = CFI_{t-k} - \sum_{i=t-k}^{t-1} INVACC_i - \sum_{i=t+1}^{t+m} INVACC_i + CFI_{t+m} \quad \text{(B4)}$$

The current accrual (left-hand side) is equal to the allocation base minus past and future accruals (right-hand side). Then, define the book value of the investment at the end of the previous year, $BVINV_{t-1}$, as :

$$BVINV_{t-1} = -CFI_{t-k} + \sum_{i=t-k}^{t-1} INVACC_i \tag{B5}$$

or the negative of the initial investment plus past accruals (e.g., prior period depreciation). Combining the last two equations yields :

$$INVACC_t = -BVINV_{t-1} - \sum_{i=t+1}^{t+m} INVACC_i + CFI_{t+m} \tag{B6}$$

At time *t*, the accountant needs to determine the remaining allocation base and then devise a rule to assign this allocation base to accruals in years *t* to *t+m*. This allocation base can be expressed as follows :

$$BVINV_{t-1} - CFI_{t+m} = \delta_t BVINV_{t-1} \tag{B7}$$

where :

$$\delta_t = \left(1 - \frac{CFI_{t+m}}{BVINV_{t-1}}\right) \tag{B8}$$

δ_t is the non-recovery rate as estimated in year *t*, or the proportion of beginning book value that is expected not to be ultimately recovered at resale. Finally, define θ_i^t as the asset consumption rate for year *i*, or the proportion of the allocation base to be converted to accruals in the year *t*, with $\sum_{i=t}^{t+m} \theta_i^t = 1$; the *t* superscript emphasizes that this is a year *t* estimate. The investment-related accrual for year *t* can then be expressed as :

$$INVACC_t = -\theta_t^t \delta_t BVINV_{t-1} \tag{B9}$$

Hence, $INVACC_t$ is a function of three factors : θ_t^t (asset consumption rate), δ_t (non-recovery rate) and $BVINV_{t-1}$ (opening book value). How this framework accommodates realistic scenarios is described below.

Holding assumptions constant regarding the non-recovery rate ($\delta_{t-1} = \delta_t$) or the expected useful life of the asset, a straight-line depreciation method will generate a cross-sectional distribution of θ_t^t that depends on investment patterns and average estimated useful life. All else equal, growing (declining) firms with relatively younger (older) assets will have a lower (higher) θ_t^t. Favorable revisions in accounting estimates regarding the terminal value (decrease in δ_t) or expected useful life (decrease in θ_t^t compared to θ_t^{t-1}) will yield lower $INVACC_t$ compared to previously predicted (or comparable firm) figures. Finally, unexpected negative shocks necessitating impairment losses will trigger a higher $INVACC_t$ through higher θ_t^t and/or δ_t. In particular, conditionally conservative accounting rules requiring *immediate* asset write-downs under poor economic conditions imply that in a cross-sectional setting, θ_t^t should be predictably higher for firms under unfavorable economic circumstances. This yields the following equation, in which 'normal' depreciation implies $\beta_2 < 0$ while conservatism implies $\beta_3 < 0$:

$$INVACC_t = \beta_0 + \beta_1 D_t + \beta_2 BVINV_{t-1} + \beta_3 D_t * BVINV_{t-1} + \varepsilon_t \tag{B10}$$

Past accounting decisions and errors (e.g., past $\theta_j^{t-i}$and δ_{t-i}) are also impounded in $BVINV_{t-1}$. Therefore, Eq. (B10) illustrates the interplay between unconditional and conditional conservatism (Beaver & Ryan, 2005). For example, a systematic (unconditional) understatement of the terminal value ($\delta_t = 0$ for all i), leading to an understatement of $BVINV_{t-1}$, will render an impairment loss unnecessary, bringing β_3 closer to 0.

B.3. Long-term operating accruals (LTOACC)

The mechanics underlying *LTOACC* are similar to *WCACC* over a longer horizon; modeling issues are obvious if in Eq. (B1), CFO_{t-1} and CFO_{t+1} are replaced by a long stream of cash flow realizations :

$$LTOACC_t = \sum_{i=t-k}^{t-1} CFO_i^t - \sum_{i=t-k}^{t-1} CFO_t^i - \sum_{i=t+1}^{t+m} CFO_t^i + \sum_{i=t+1}^{t+m} CFO_i^t + \sum_{i=t+1}^{t+m} \varepsilon_i^t - \sum_{i=t-k}^{t-1} \varepsilon_t^i \tag{B11}$$

In Eq. (B11), the first (fourth) term is the sum of past (future) *CFO* to include in the current year's performance, while the second (third) term refers to current *CFO* included in past (future) earnings. For example, the recognition (reversal) of deferred tax liabilities associated with a future (current) cash tax outflow would be included in the fourth (second) term, while the initial recording of unearned revenue (its realization and recognition in earnings) would affect the third (first) term.

The difficulties in isolating the relevant $CFO_{t-i}^{\boldsymbol{t}}$ ($CFO_{t+j}^{\boldsymbol{t}}$) from CFO_{t-i} (CFO_{t+j}) for any past (future) period makes estimation of Eq. (B11) unappealing. However, as with *INVACC*, a long-term balance sheet asset has to be used to enable past cash outflows to be recorded as a current-year expense, and inversely for the reversal of deferred liabilities. Therefore, the first term is a fraction λ_t of the beginning-of-year book value of long-term operating assets ($BVLTA_{t-1}$), plus a fraction φ_t of the beginning-of-year book value of long-term operating liabilities ($BVLTL_{t-1}$):

$$\sum_{i=t-k}^{t-1} CFO_i^t = -\lambda_t BVLTA_{t-1} + \varphi_t BVLTL_{t-1} \tag{B12}$$

The association between $LTOACC_t$ and CFO_t is again grounded in the noise reduction role as some current cash flows are mechanically transferred to the performance of another period. However, the positive correlation between current and future *CFO*, central to the gain and loss recognition role, affects $LTOACC_t$ in two ways through the third and fourth terms. To see how the third term is affected, consider a typical capitalization decision : the accountant has to determine the level of future economic benefits associated with a current cash outflow. If current performance is poor (CFO_t is low), capitalization is harder to justify because CFO_t is a proxy for future CFO_t and the negative mechanical association between $LTOACC_t$ and CFO_t is therefore muted. The fourth term is affected because conservative accounting rules imply that estimates of future cash flows, with which CFO_t is positively associated, are more strongly reflected in earnings when performance is poor.[36]

Hence, the empirical specification for $WCACC_t$ (Eq. (B2)) can be adapted to $LTOACC_t$ by making two adjustments : (a) replace CFO_{t-1} with the opening book value of long-term operating assets and liabilities, and (b) replace CFO_{t+1} with an additional role bestowed upon CFO_t :

$$LTOACC_t = \beta_0 + \beta_1 BVLTA_{t-1} + \beta_2 BVLTL_{t-1} + \beta_3 D_t + \beta_4 CFO_t + \beta_5 D_t * CFO_t + \varepsilon_t \tag{B13}$$

Estimation of Eq. (B13) should yield $\beta_1 < 0$ (some capitalized assets are expensed in the current period), $\beta_2 > 0$ (some deferred liabilities are recorded as revenues), and $\beta_5 > 0$ as before (accruals are more positively associated with current cash flows when performance is bad). The sign of β_4 is uncertain because CFO_t is the only variable that captures future operating performance; contrary to the $WCACC_t$ model which included future cash flows, the relative importance of the noise reduction and gain and loss recognition roles may be context-specific.

[36] Of course, a large number of cash flows in the more distant future are largely unrelated to current performance and depend on firm- (or accrual-) specific factors that cannot be readily accommodated by the model.

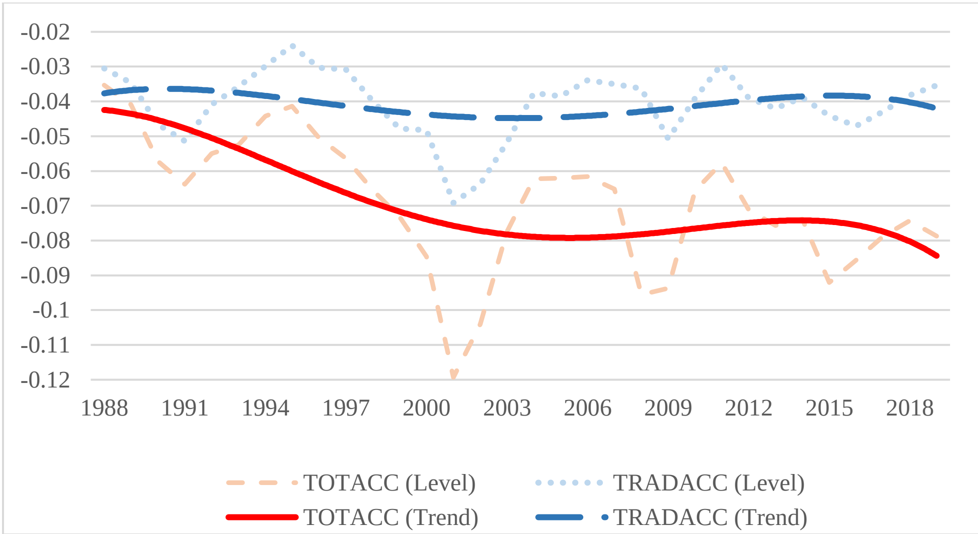

FIGURE 1: Average accruals over 1988-2019

Variables are defined in Appendix A. This figure plots the levels of average total accruals (*TOTACC*, dashed pale red line) and of working capital accruals plus depreciation (*TRADACC*, dotted blue line) over the 1988-2019 period for US firms. The solid red curve (long-dashed blue curve) shows the polynomial trend for *TOTACC* (*TRADACC*).

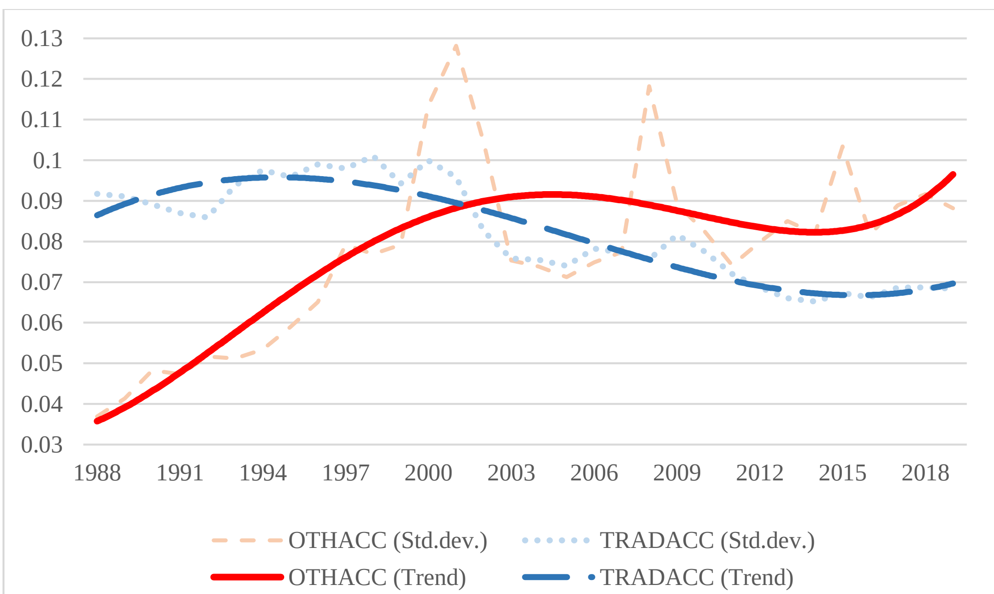

FIGURE 2: Cross-sectional dispersion of accruals over 1988-2019

Variables are defined in Appendix A. This figure plots the cross-sectional standard deviation of other accruals (*OTHACC*, dashed pale red line) and of working capital accruals plus depreciation (*TRADACC*, dotted blue line) over the 1988-2019 period for US firms. The solid red curve (long-dashed blue curve) shows the polynomial trend for the standard deviation of *OTHACC* (*TRADACC*).

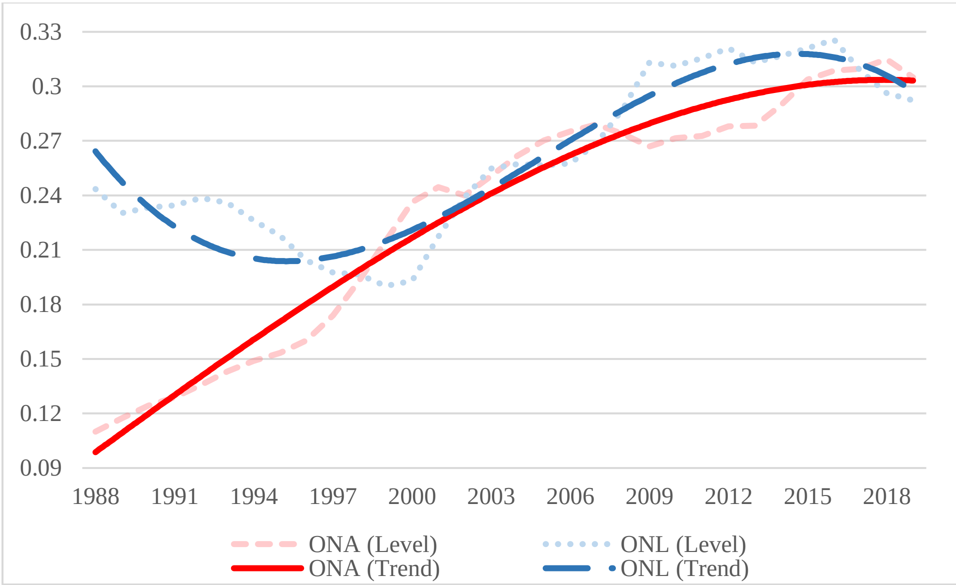

FIGURE 3: The growing importance of long-term other nonfinancial assets and liabilities over 1988-2019

Variables are defined in Appendix A. In this figure, the dashed pale red line plots long-term other nonfinancial assets (*ONA*) as a percentage of nonfinancial assets and the dotted blue line plots long-term other nonfinancial liabilities as a percentage of nonfinancial liabilities over the 1988-2019 period for US firms. The solid red curve (long-dashed blue curve) shows the polynomial trend for *ONA* (*ONL*).

TABLE 1. Selected balance sheet accounts, cash flows, and accruals

Account name	Account type	Cash flow category	Associated accrual	Associated accrual category
Current assets				
Cash and equivalents	Financial	N/A	N/A	N/A
Short-term investments	Financial	CFI	Profit/loss from change in fair value	Other accruals
Accounts receivable	Nonfinancial	CFO	Change in accounts receivable	Working capital accruals
Inventories	Nonfinancial	CFO	Change in inventories	Working capital accruals
Prepaid expenses/other	Nonfinancial	CFO	Change in other current assets	Working capital accruals
Long-term assets				
Long-term investments	Financial	CFI	Profit/loss from change in fair value, equity method earnings	Other accruals
Property, plant & equipment	Nonfinancial	CFI	Depreciation, impairment loss	Depreciation, other accruals
Intangible assets	Nonfinancial	CFI	Amortization, impairment loss	Depreciation, other accruals
Goodwill	Nonfinancial	CFI	Impairment loss	Other accruals
Deferred tax assets	Nonfinancial	CFO	Deferred tax expense/recovery	Other accruals
Long-term prepaid exp./other	Nonfinancial	CFO	Amortization or other items	Depreciation, other accruals
Current liabilities				
Short-term debt	Financial	CFF	N/A	N/A
Accounts payable	Financial	CFO	Change in accounts payable	Working capital accruals
Deferred revenues/other	Nonfinancial	CFO	Change in other current liabilities	Working capital accruals
Long-term liabilities				
Long-term debt	Financial	CFF	Amortization of debt premium/discount	Other accruals
Deferred tax liabilities	Nonfinancial	CFO	Deferred tax expense/recovery	Other accruals
Pension liabilities	Nonfinancial	CFO	Pension cost in excess of contributions	Other accruals
Deferred tax assets	Nonfinancial	CFO	Deferred tax expense/recovery	Other accruals
Long-term deferred rev./other	Nonfinancial	CFO	Change in other liabilities	Other accruals

This table lists selected balance sheet accounts and their type – financial or nonfinancial instruments according to FASB/IASB definitions –, cash flow category – cash flows from operating (CFO), investing (CFI) or financing (CFF) activities –, along with the main associated accruals and accrual category – working capital, depreciation or other.

TABLE 2 : SAMPLE SELECTION

Description	Number of firm-year observations		
	1963-2019	**1963-1987**	**1988-2019**
US firm-years on Compustat	386,002	128,361	257,641
Remove :			
Financial industry and missing SIC code	62,454	14,441	48,013
Average assets missing or below $10M (in year 2000 dollars)	71,522	22,223	49,299
Missing basic accounting variables	15,783	6,777	9,006
Sample for time trends	236,243	84,920	151,323
Missing accrual model variables	115,924	84,920	31,004
Sample for accrual model estimation	**120,319**	**0**	**120,319**

This table describes the sample selection procedure for the data used in this paper. Basic accounting variables include cash and short-term investments (Compustat *CHE*), current assets (*ACT*), net PP&E (*PPENT*), total assets (*AT*), debt in current liabilities (*DLC*), current liabilities (*LCT*), long-term debt (*DLTT*), total liabilities (*LT*), income before extraordinary items (*IB*) and depreciation and amortization (*DP*). For 1963-1987, basic accounting variables also include working capital accruals using the balance sheet method (lagged *ACT*, *LCT*, *CHE* and *DLC*). For 1988-2019, basic accounting variables also include the following statement of cash flows accounts: income before extraordinary items (*IBC*), depreciation and amortization (*DPC*), working capital accruals (one nonmissing among *RECCH*, *INVCH*, *TXACH*, *APALCH* and *AOLOCH*), other accruals (one nonmissing among *TXDC*, *SPPIV*, *ESUBC* and *FOPO*) and cash flows from operations (*OANCF* and *XIDOC*). Accrual model estimation requires lagged and one-year-ahead *OANCF* and *XIDOC*, lagged and current sales and accounts receivable (*SALE* and *RECT*), the natural logarithm of total assets (*LASSETS*), the book-to-market ratio (*BM*), and indicators for operating shocks (*OPSHOCK*) and Big N auditors (*BIG4*).

TABLE 3 : EVOLUTION OF BALANCE SHEET ACCOUNT CATEGORIES AS A PERCENTAGE OF TOTAL ASSETS

Account	Mnemonic	1963-1977	1978-1987	1988-1997	1998-2007	2008-2019	Trend 1963-2019		Trend 1963-1987		Trend 1988-2019	
Number of observations		43,252	41,668	47,586	54,809	48,928						
Cash & equivalents	*CHE*	8.7	9.6	13.7	19.4	21.4	0.304	***	0.010		0.392	***
Other current assets	*WCAPA*	45.8	41.8	36.4	29.4	24.2	-0.503	***	-0.280	***	-0.575	***
Current assets		54.6	51.4	50.1	48.8	45.6	-0.200	***	-0.269	***	-0.184	***
Fixed assets (net)	*PPENT*	37.1	40.0	35.1	29.2	29.0	-0.220	***	0.197	***	-0.308	***
Long-term investments	*INVEST*	3.5	3.4	2.9	2.9	2.8	-0.018	***	-0.009		-0.009	***
Other nonfinancial assets	***ONA***	***4.8***	***5.2***	***11.9***	***19.1***	***22.4***	***0.439***	*********	***0.082***	*********	***0.502***	*********
Total assets		100.0	100.0	100.0	100.0	100.0						
Debt in LCT	*DLC*	7.0	6.9	6.2	5.3	4.0	-0.061	***	0.045	*	-0.117	***
Other current liab.	*WCAPL*	18.5	20.5	20.4	20.8	19.5	0.014	*	0.128	***	-0.054	***
Curr. Liabilities		25.6	27.4	26.6	26.1	23.5	-0.044	***	0.174	***	-0.166	***
Long-term debt	*DLTT*	19.2	21.3	20.6	19.9	20.7	0.043	***	0.260	***	0.001	
Other nonfinancial liabilities	***ONL***	***3.2***	***5.5***	***6.5***	***6.9***	***9.1***	***0.131***	*********	***0.180***	*********	***0.116***	*********
Total liabilities		48.2	54.3	53.8	52.9	53.4	0.141	***	0.639	***	-0.049	
Shareholders'equity		51.8	45.7	46.2	47.1	46.6	-0.141	***	-0.639	***	0.049	
ONA as a % of nonfinancial assets		5.7	6.2	14.3	24.4	28.9	0.576	***	0.100	***	0.691	***
ONL as a % of nonfinancial liabilities		15.5	21.3	22.4	23.0	30.9	0.331	***	0.499	***	0.381	***

This panel presents the sample mean for various balance sheet accounts by time period. Variables are defined in Appendix A and are deflated by year-end assets (AT_t). The sample is described in Table 2 and in text. The last two rows report the average ratio of ONA (ONL) to nonfinancial assets (liabilities), defined as *ONA*/(*AT-CHE-INVEST*) (*ONL*/(*LT-DLC-DLTT*)). The last three columns show the coefficient estimate for β in $mean(VAR)_t = \alpha + \beta(t - 1963) + \varepsilon$, where t indexes years, for the 1963-2019, 1963-1987 and 1988-2019 periods respectively. A * (**, ***) indicates significance at the 10% (5%, 1%) level in a two-tailed test.

TABLE 4 : ACCRUALS AND OTHER NONFINANCIAL ASSETS AND LIABILITIES

Model		Benchmark		Augmented		Full	
Variable	**Exp.**	**Coeff.**	**t-stat**	**Coeff.**	**t-stat**	**Coeff.**	**t-stat**
$1/AT_{avg}$	?	0.2643	7.9***	0.2869	8.7***	0.2716	8.3***
CFO_{t-1}	+	0.2275	38.3***	0.2227	38.1***	0.2153	37.1***
CFO_t	-	-0.6148	77.8***	-0.6515	83.5***	-0.6366	81.8***
DCF_t	?	0.0031	1.9*	-0.0033	2.0**	0.0261	10.1***
DCF_t*CFO_t	+	0.4291	38.6***	0.4859	44.2***	0.4895	44.4***
CFO_{t+1}	+	0.1645	37.7***	0.1718	39.6***	0.1742	40.2***
$\Delta SALE_t$	+	0.0711	33.0***	0.0638	29.7***	0.0638	29.9***
$PPENT_{t-1}$	-	-0.0889	31.5***	-0.1357	44.3***	-0.1196	38.0***
$LASSETS_t$	?	0.0071	21.1***	0.0087	24.1***	0.0082	23.5***
BM_t	?	0.0054	11.6***	0.0052	11.4***	0.0051	11.1***
$OPSHOCK_t$	-	-0.0272	13.9***	-0.0225	12.0***	-0.0203	10.9***
$BIG4_t$	-	-0.0041	2.9***	-0.0058	4.3***	-0.0075	5.6***
ONA_{t-1}	**-**			**-0.1403**	**38.2*** **	**-0.0929**	**27.2*** **
ONL_{t-1}	**+**			**0.0853**	**12.6*** **	**0.0525**	**7.5*** **
DCF_t*$PPENT_{t-1}$	**-**					**-0.0285**	**4.3*** **
DCF_t*ONA_{t-1}	**-**					**-0.1712**	**18.7*** **
DCF_t*ONL_{t-1}	**+**					**0.1013**	**6.6*** **
F. E.		*Yr+Ind*		*Yr+Ind*		*Yr+Ind*	
Adjusted R^2		0.2227		0.2523		0.2619	

Variable definitions are in Appendix A. The dependent variable is total accruals (*TOTACC*). Models correspond to Eq. (5) (Benchmark), Eq. (6) (Augmented) and Eq. (7) (Full). The number of firm-year observations is 120,319. Expected signs (column *Exp.*) are based on prior literature. Test statistics are based on standard errors clustered by firm; a * (**, ***) indicates statistical significance at the 10% (5%, 1%) level in a two-tailed test.

TABLE 5 : SUMMARY OF SIMULATIONS – DACC DETECTION RATE

Dep. var.		*TOTACC*			*TOTACC*	
Firms		*All firms*			*Top 25% of ONA*	
Version	Bench.	Augm.	Full	Bench.	Augm.	Full
Column	(1)	(2)	(3)	(4)	(5)	(6)
Seed pct.						
0%	3.0%	3.1%	3.2%	2.1%	2.7%	3.0%
2%	4.3%	4.3%	4.7%	2.9%	3.8%	4.4%
4%	6.3%	6.6%	7.2%	4.0%	5.8%	6.6%
6%	10.6%	11.2%	12.0%	6.3%	10.3%	10.9%
8%	16.9%	18.1%	19.2%	11.1%	17.1%	17.6%
10%	25.4%	27.0%	28.2%	17.4%	26.3%	26.9%
12%	35.4%	37.6%	38.6%	26.7%	38.1%	38.2%
14%	46.2%	48.1%	48.9%	38.4%	49.7%	49.7%
16%	56.3%	57.9%	58.6%	49.9%	60.0%	59.8%
18%	65.3%	66.3%	66.7%	60.5%	68.2%	67.8%
20%	72.4%	73.1%	73.0%	68.4%	75.0%	74.1%

This table reports the detection rate of seeded discretionary accruals (out of 50,000 simulations for each cell). In each simulation:

1) We set $EVENT_i$=1 for a randomly chosen observation from the full sample (n=120,319).
2) We set $EVENT_i$=0 for all other observations in the same industry and fiscal year as the event observation.
3) We manipulate total accruals for the event firm by increasing reported total accruals ($TOTACC_i$, as defined in Appendix A) by a given percentage of average total assets (column "Seed pct."). For example, for the row labeled "4%", $TOTACC\_M_i = TOTACC_i + 0.04$. For non-event observations, $TOTACC\_M_i = TOTACC_i$.
4) We estimate abnormal accruals ($DACC\_M_i$) as the residuals from the following accrual models:

Columns 1 and 4	$TOTACC\_M_i = \alpha_1 + \beta_1(1/AT_{avg,i}) + \beta_2 CFO_{i-1} + \beta_3 CFO_i + \beta_4 DCF_i + \beta_5 DCF_i{*}CFO_i + \beta_6 CFO_{i+1} + \beta_7 \Delta SALE_i + \beta_8 PPENT_{i-1} + \varepsilon_i$
Columns 2 and 5	$TOTACC\_M_i = \alpha_1 + \beta_k$[Column (1) vars] $+ \beta_9 ONA_{i-1} + \beta_{10} ONL_{i-1} + \varepsilon_i$
Columns 3 and 6	$TOTACC\_M_i = \alpha_1 + \beta_k$[Column (2) vars] $+ \beta_{11} DCF_i{*}PPENT_{i-1} + \beta_{12} DCF_i{*}ONA_{i-1} + \beta_{13} DCF_i{*}ONL_{i-1} + \varepsilon_i$

5) We estimate the following model:
$DACC\_M_i = \alpha_1 + \beta_1 EVENT_i + \varepsilon_i$

The table shows the percentage of simulations in which β_1 is positive and significant at the 10% level. For example, when manipulated total accruals for the event firm are 4% of average total assets ("4%" row), when the model is the augmented model (column (2)), the detection rate of 6.6% indicates that β_1 is positive and significant in 6.6% of simulations. Columns 1 to 3 (4 to 6) report results for all firms (firms in the top 25% of ONA).

TABLE 6 : OTHER NONFINANCIAL ASSETS AND LIABILITIES AND COMPONENTS OF TOTAL ACCRUALS

Dep. var.		***WCACC***		***DEPACC***		***OTHACC***		***TOTACC***	
Variable	**Exp.**	**Coeff.**	**t-stat**	**Coeff.**	**t-stat**	**Coeff.**	**t-stat**	**Coeff.**	**t-stat**
$1/A_{avg}$	?	0.0852	4.4***	-0.0509	3.6***	0.2440	11.5***	0.2716	8.3***
CFO_{t-1}	+	0.1740	45.8***	-0.0061	4.6***	0.0310	8.5***	0.2153	37.1***
CFO_t	-	-0.4547	85.1***	-0.0721	23.5***	-0.0660	13.7***	-0.6366	81.8***
DCF_t	?	0.0296	20.1***	-0.0031	4.1***	0.0008	0.5	0.0261	10.1***
DCF_t*CFO_t	+	0.2188	37.6***	0.1156	27.8***	0.1410	19.2***	0.4895	44.4***
CFO_{t+1}	+	0.1372	50.0***	-0.0148	16.2***	0.0384	14.2***	0.1742	40.2***
$\Delta SALE_t$	+	0.0658	43.2***	-0.0060	12.5***	0.0024	1.9*	0.0638	29.9***
$PPENT_{t-1}$	-	-0.0070	4.4***	-0.0813	48.3***	-0.0295	13.9***	-0.1196	38.0***
$LASSETS_t$	?	0.0014	7.5***	0.0023	12.3***	0.0043	19.1***	0.0082	23.5***
BM_t	?	0.0001	0.5	0.0009	6.8***	0.0038	9.9***	0.0051	11.1***
$OPSHOCK_t$	-	-0.0062	7.3***	-0.0016	3.4***	-0.0126	9.2***	-0.0203	10.9***
$BIG4_t$	-	-0.0025	3.2***	-0.0043	7.4***	-0.0001	0.1	-0.0075	5.6***
$\boldsymbol{ONA_{t-1}}$	**-**	**-0.0059**	**3.7*** **	**-0.0364**	**24.3*** **	**-0.0479**	**19.6*** **	**-0.0929**	**27.2*** **
$\boldsymbol{ONL_{t-1}}$	**+**	**-0.0051**	**1.4**	**0.0069**	**2.1** **	**0.0446**	**9.0*** **	**0.0525**	**7.5*** **
$\boldsymbol{DCF_t*PPENT_{t-1}}$	**-**	**-0.0452**	**16.1*** **	**0.0234**	**8.4*** **	**-0.0041**	**0.9**	**-0.0285**	**4.3*** **
$\boldsymbol{DCF_t*ONA_{t-1}}$	**-**	**-0.0357**	**10.3*** **	**-0.0328**	**12.2*** **	**-0.0969**	**14.1*** **	**-0.1712**	**18.7*** **
$\boldsymbol{DCF_t*ONL_{t-1}}$	**+**	**0.0190**	**2.5** **	**0.0003**	**0.1**	**0.0676**	**6.0*** **	**0.1013**	**6.6*** **
F. E.		*Yr+Ind*		*Yr+Ind*		*Yr+Ind*		*Yr+Ind*	
Adjusted R^2		0.3139		0.3294		0.1260		0.2619	
Adjusted R^2 (Benchmark)		0.3093		0.2856		0.0967		0.2227	

Variable definitions are in Appendix A. This table reports estimation results of the full model (Eq. (5)) with working capital accruals (*WCACC*), depreciation and amortization (*DPACC*), other accruals (*OTHACC*) and total accruals from the statement of cash flows (*TOTACC*). The number of firm-year observations is 120,319. Expected signs (column *Exp.*) are based on prior literature on *TOTACC* except for bolded variables, which are discussed in section 2. Test statistics are based on standard errors clustered by firm. A * (**, ***) indicates statistical significance at the 10% (5%, 1%) level in a two-tailed test. The row labeled Adjusted R^2 (Benchmark) reports the Adjusted R^2 from the benchmark model (Eq. (3)), which excludes the last five explanatory variables.

TABLE 7 : COMPONENTS OF LONG-TERM OTHER NONFINANCIAL ASSETS AND LIABILITIES

Model		Augmented		Full	
Variable	Exp.	Coeff.	t-stat	Coeff.	t-stat
$1/A_{avg}$	?	0.2880	8.8***	0.2789	8.6***
CFO_{t-1}	+	0.2214	37.9***	0.2136	36.9***
CFO_t	-	-0.6510	83.3***	-0.6362	81.8***
DCF_t	?	-0.0028	1.7*	0.0250	9.7***
DCF_t*CFO_t	+	0.4868	44.2***	0.4872	44.2***
CFO_{t+1}	+	0.1721	39.7***	0.1743	40.2***
$\Delta SALE_t$	+	0.0632	29.5***	0.0633	29.8***
$PPENT_{t-1}$	-	-0.1379	44.1***	-0.1211	37.7***
$LASSETS_t$	?	0.0085	23.6***	0.0081	23.2***
BM_t	?	0.0051	11.2***	0.0050	10.8***
$OPSHOCK_t$	-	-0.0220	11.7***	-0.0199	10.7***
$BIG4_t$	-	-0.0056	4.1***	-0.0073	5.4***
$INTAN_{t-1}$	**-**	**-0.1358**	**36.0*****	**-0.0899**	**25.8*****
AO_{t-1}	**-**	**-0.1917**	**24.0*****	**-0.1331**	**18.2*****
$TXDITC_{t-1}$	+	**0.1657**	**12.6*****	**0.1040**	**8.4*****
LO_{t-1}	+	**0.0818**	**11.0*****	**0.0512**	**6.4*****
$DCF_t*PPENT_{t-1}$	**-**			**-0.0315**	**4.6*****
$DCF_t*INTAN_{t-1}$	**-**			**-0.1804**	**18.0*****
DCF_t*AO_{t-1}	**-**			**-0.1706**	**8.5*****
$DCF_t*TXDITC_{t-1}$	+			**0.4305**	**8.1*****
DCF_t*LO_{t-1}	**+**			**0.0842**	**5.2*****
F. E.		*Yr+Ind*		*Yr+Ind*	
Adjusted R^2		0.2529		0.2628	

Variable definitions are in Appendix A. The dependent variable is total accruals (*TOTACC*). Models correspond to Eq. (6) (Augmented) and Eq. (7) (Full), where long-term other nonfinancial assets and liabilities (ONA_{t-1} and ONL_{t-1}) are replaced by intangibles ($INTAN_{t-1}$), other assets (AO_{t-1}), deferred tax liabilities ($TXDITC_{t-1}$) and other liabilities (LO_{t-1}). The number of firm-year observations is 120,319. Expected signs (column *Exp.*) are based on prior literature except for bolded variables, which are discussed in text. Test statistics are based on standard errors clustered by firm. A * (**, ***) indicates statistical significance at the 10% (5%, 1%) level in a two-tailed test.