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The Graduate School

The Mary Jean and Frank P. Smeal College of Business Administration

AN EXAMINATION OF LONG-LIVED ASSET IMPAIRMENTS

A Thesis in

Business Administration

by

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Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Doctor of Philosophy

December 2002

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ABSTRACT

Prior research reveals that write-offs of long-lived assets are both large in magnitude and frequent in occurrence. Responding to calls for enhanced reporting of these items, the FASB issued SFAS 121, *Accounting for the Impairment of Long-Lived Assets*. However, its effect on the characteristics of reported write-offs remains unclear, as implementation requires inherently subjective estimates. Further, critics (including the SEC) maintain that the standard has failed to improve financial reporting. Motivated in part by this debate, this paper contrasts the characteristics of write-offs reported prior versus subsequent to the issuance of SFAS 121. Empirical results reveal that economic factors (consistent across macro, industry, and firm-specific variables) have a stronger mapping into write-offs reported *prior* to SFAS 121, supporting critics of the standard. Results also indicate that "big bath" reporting incentives have a higher association with write-offs reported after the standard's implementation. This is consistent with managers applying more flexibility after adoption of SFAS 121, and may reflect either that managers are acting opportunistically, or that they are providing more private information about the underlying performance of their firms. The results are robust to a number of alternative specifications and variable definitions. However, my tests currently do not distinguish between the two possible interpretations of greater reporting flexibility. Finally, results from a second market-based analysis fail to provide evidence of a difference in the timeliness of asset write-offs across the two periods.

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ACKNOWLEDGEMENTS

I would like to thank the Jesuits and lay teachers at Regis High School, who sowed the first real seeds of intellectual curiosity in me.

I wish to thank my parents, Barbara and John, and my brother, Ken, for all of their love and support throughout my life. It has taken me far too long to appreciate how vital they've been to all my successes.

Finally, I wish to thank my beloved wife, Elisa. If I were more gifted with the tongue, this would be the point where I would break into verse. Unfortunately, I'm an accountant. Still – know that you are ever the cornerstone upon which all my achievements are built. I could never have done this without you.

And my daughter, Jenna. Though you're still too young to read this – maybe one day you will, and you'll know just how incredibly you've changed my perspective on what's important, and that you're the greatest gift in my life.

"What a long, strange trip it's been."

This dissertation has been brought to you by the letter w.

1. Introduction

Prior research reveals that write-offs of long-lived assets are both large in magnitude and frequent in occurrence (e.g., Elliott and Hanna [1996], Francis, Hanna and Vincent [1996]). Prior to 1995, accounting rules generally did not address the reporting of asset impairments; consequently, managers had substantial flexibility over the timing, calculation, and presentation of these items during this period. However, as the frequency and magnitude of write-offs increased during the 1990's, financial statement users called for improved reporting of these economic events. The FASB responded with the issuance of SFAS 121, *Accounting for the Impairment of Long-Lived Assets*, in 1995, with the intent of reducing managerial flexibility and enhancing the reporting of asset impairments.[1] However, critics continue to question the standard's effectiveness: "today's U.S. impairment standards are resulting in nothing more than one-time 'Big Bath' charges that lack relevance or economic reality" (Lynn Turner, then Chief Accountant of the SEC, June 7, 2001).

Motivated in part by this debate, this paper examines SFAS 121's effect on the characteristics of reported asset write-offs by contrasting these items under two regimes: pre-SFAS 121 and post-SFAS 121. As discussed above, prior to SFAS 121, management has substantial flexibility over the calculation and reporting of write-offs due to the sparse authoritative guidance over these items during this period. In the post-SFAS 121 regime, the standard is intended to provide more structure on the determination and reporting of write-off amounts. However, the standard's effect on the characteristics of these write-offs, including managerial flexibility applied in determining their amount and timing, is unclear *a priori*. For example, the mapping of the underlying economic events into the reported write-offs may

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[1] SFAS 121 directly alludes to the FASB's intent to reduce flexibility (e.g., paragraphs 2, 37, and 47).

increase under SFAS 121, as the criteria specified by the standard may enhance this mapping

process. Alternatively, the guidelines specified by the standard, such as the use of undiscounted

cash flows as the trigger for the existence of an impairment, may decrease this mapping.

Similarly, the reporting discretion applied by managers to determine write-offs may decrease

after SFAS 121, to the extent it imposes greater (and enforceable) structure on the reporting of

this event. However, implementation of SFAS 121 requires inherently subjective estimates and

assumptions. Further, recent examples in the popular press suggest that firms may, in fact,

leverage detail-oriented U.S. standards to justify *more aggressive* accounting choices. This

suggests an alternative possibility: after adoption of SFAS 121, managers may apply even greater

discretion in their reporting choices for write-offs, as the standard's subjective (but now explicit)

criteria provide an avenue for managers to justify their reporting choices that was unavailable

prior to the standard.[2] Thus, the effect of SFAS 121 on reporting flexibility is also unclear, as

discretion in calculating write-offs may decrease, increase, or not change at all upon adoption of

the standard. Finally, the effect of reporting flexibility on information provided to financial

statement users is also unclear, as managers may use it opportunistically or to better

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[2] This line of reasoning is akin to a "safe harbor" argument. Under this argument, managers may leverage the more defined criteria in procedural-based standards to justify their reporting decisions, whereas conceptual standards may limit such behavior. This perspective has received increasing support from those critical of U.S. standards as overly procedural (versus conceptual). For example, Enron justified aggressive (i.e., more flexible) reporting choices as "not inconsistent" with the rules and requirements set forth under GAAP (for example, see McNamee and Capell, *Business Week*, May 20, 2002).

　Restated within the current context, SFAS 121 must reduce the *available* options (and thus available flexibility) to report write-offs relative to before the standard. This must be the case, as no explicit guidelines existed prior to the standard save for the conceptual framework, and SFAS 121 did place some structure (i.e., eliminated some choices) on how impairments could be calculated. However, available flexibility provides only an upper bound for the flexibility managers actually *exercise* in their reporting choices. In other words, it is a necessary (but not sufficient) condition for the extent to which managers apply discretion in their reporting. This latter will be reflected in the data, and is ultimately the inquiry of this paper. Thus, it is possible that upon adoption of SFAS 121, managers *exercise* greater flexibility than before, as the now "brighter line" criteria under the standard afford a justification for choices to take (or not take) write-offs that was unavailable prior to the standard.

communicate private information (Schipper [1989], Healy and Palepu [1993], Wilson [1996], Healy and Wahlen [1999]).

Beyond the debate surrounding SFAS 121's effectiveness, the contrast of long-lived asset write-offs across these regimes represents an interesting area of inquiry for a number of reasons. First, both the magnitude and frequency of asset write-offs increased substantially during the 1990's (Elliott and Hanna [1996]), suggesting this is an economically significant subset of events. Second, asset impairments directly affect net income, suggesting (explicit and/or implicit) incentives may exist for managers to manipulate write-off amounts. Third, financial statement users likely find long-lived assets more difficult to evaluate for impairment relative to other assets groups (e.g., inventory), as fair value information is generally more difficult to obtain for long-lived assets due to their lower liquidity. Finally, prior research has focused on write-offs in the pre-SFAS 121 period, with little research examining write-offs in the post-SFAS 121 period, and none contrasting reported amounts across the two regimes.

I conduct two primary empirical analyses contrasting reported write-offs across the pre-SFAS 121 and post-SFAS 121 regimes. First, I examine whether the associations between write-off amounts and economic factors, as well as the associations between write-off amounts and reporting incentives, differ across the two regimes. Second, I examine whether the timeliness of reported asset write-offs differs across the regimes. This latter analysis is motivated by prior research, which uses the equity market as a benchmark to assess the timeliness of reported accounting numbers (e.g., Collins, et al. [1994], Alciatore, Easton and Spear [2000], Barth, Beaver, and Landsman [2001]). The former analysis is motivated by discussion within prior research, which suggests there may be benefits to considering other uses of accounting

information besides equity valuation to assess the effects of standards on the qualities of reported financial information (e.g., Watts and Zimmerman [1978], Holthausen and Watts [2001]).

The empirical results from the analysis examining the determinants of write-off amounts indicate that write-offs reported prior to SFAS 121 have a stronger association with economic factors (consistent across macro, industry, and firm-specific variables), and lower association with "big bath" reporting incentives, than those reported after SFAS 121. These results are robust to a number of alternative specifications and variable measurements. Results from the second analysis using stock prices as a benchmark, however, fail to provide evidence either of write-offs being timely within each regime or of a difference in the timeliness of write-offs across the two regimes.

The stronger associations between economic factors and write-offs reported in the pre-SFAS 121 regime are consistent with SFAS 121 weakening the reporting of long-lived asset impairments, as voiced by critics of the standard. Further, the stronger association between write-offs and "big bath" reporting incentive after the adoption of SFAS 121 suggests that managers are applying more flexibility subsequent to the standard's implementation. However, the latter result reflects two possible interpretations. First, the greater reporting flexibility applied by managers subsequent to SFAS 121 may be opportunistic, reflecting distortions in the underlying economics of the firm. This would be consistent with anecdotal evidence that managers take such excessive charges to free up future earnings (e.g., Turner [2001]; Haddad and Borrus [2002]). Alternatively, managers may apply greater flexibility after SFAS 121 to signal the firm's true value, as suggested by the model in Kirschenheiter and Melumad [2002]. My tests do not currently distinguish between these two possible interpretations. Nonetheless, the overall results increase our understanding of long-lived asset write-offs, and may provide

additional insights to standard setters in their evaluation of the accounting treatment for such economic events.[3]

The remainder of this paper is organized as follows. Section 2 discusses the background and research relating to asset impairments. Section 3 presents the hypothesis development and research design. Section 4 presents the sample selection, descriptive statistics, and empirical results. Section 5 concludes.

2. *Background*

The reporting of long-lived asset impairments has historically been a challenging area for accountants. For example, the evaluation of a long-lived asset for impairment requires forecasting the asset's future performance, often over a number of years into the future. This evaluation is further confounded by a lack of available fair values, as long-lived assets typically have low liquidity. Thus, assessing long-lived assets for impairment often requires substantial judgment and estimates. Prior to SFAS 121, accounting standards generally did not address when impairment losses should be recognized or how they should be measured, and thus practice was diverse.[4] The significant rise in the frequency and magnitude of write-offs brought this topic

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[3] Further, recent issuances by the FASB are indicative of a greater use of impairment testing for long-lived assets. For example, SFAS 142, *Goodwill and Other Intangible Assets* (effective January 1, 2002), eliminates the amortization of goodwill, and requires annual impairment testing of this asset.

[4] For example, consider the following results of a 1985 Financial Executive Institute survey of firms that recorded write-offs:

(1) impairment criteria – in deciding whether to record an impairment, 36% used a permanence criteria, and 60% used SFAS No. 5's probability criteria;

(2) asset groupings (which determines how losses/gains are netted) – 28% used individual assets, 38% used the production facility group, 16% used a product line group, and 18% used a division, subsidiary, or other group;

(3) measurement of impairment – 46% used net realizable value, 18% used undiscounted future net cash flows, 14% used the present value of future net cash flows, and 18% used a combination of these methods; and

(4) presentation – 38% displayed the write-off as a separate line item within continuing operations, 24% displayed it as a separate line item outside continuing operations, and 38% did not provide separate presentation.

Similar results were reported in a 1991 update of this same survey. Note that the diversity in the calculation of these impairments is not necessarily information reducing, as the evaluation of may be quite context-specific.

to the FASB agenda in 1988, culminating in the adoption of SFAS 121, which became effective

for all entities for fiscal years beginning after December 15, 1995, though early adoption was

encouraged. The FASB objective in issuing SFAS 121 was to provide greater comparability and

consistency in the accounting treatment of impairments for long-lived assets. In particular, this

standard sought to address (1) the criteria for *when* to test for the existence of an impairment, (2)

the level at which to *group* assets in testing for impairment, (3) the measurement basis for

determining the *existence* of an impairment, (4) the *measurement* of the impairment, and (5) the

presentation of the recognized amount.[5]

SFAS 121 states "an entity shall review long-lived assets and certain identifiable

intangibles to be held and used for impairment whenever events or changes in circumstances

indicate that the carrying amount of an asset may not be recoverable." (paragraph 4) While the

standard is intentionally general in defining "events or changes in circumstances," it does

provide a list of examples to serve as guidance.[6] If such events suggest that the carrying amount

of an asset may not be recoverable, the entity must test for impairment, grouping assets at the

lowest level having identifiable cash flows that are largely independent of the cash flows of other

groups of assets. An impairment exists if the asset's recoverable cost (i.e., *undiscounted* net cash

inflows) is lower than its carrying value. In this case, the entity must recognize an impairment,

measured as the difference between the asset's carrying value and fair value. Fair value should

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However, prior to SFAS 121, impairment rules did exist for specific asset classes (e.g., inventory at lower of cost or market under ARB 43), specific industries (e.g., insurance enterprises under SFAS 60) and specific situations (e.g., disposals of segments under APB 30).

[5] SFAS 144, *Accounting for the Impairment or Disposal of Long-Lived Assets* (effective December 15, 2001) replaces SFAS 121. The major changes include the elimination of goodwill from the scope (as discussed in footnote 3, goodwill is now covered under SFAS 142), and greater incorporation of present value concepts for determining estimated fair values. However, SFAS 144 does not change the general provisions of SFAS 121, suggesting insights obtained from examining the latter will still have implications for the new standard.

[6] For example: "a significant decrease in the market value of an asset" or "a significant change in the extent or manner in which the asset is used." (paragraph 5)

represent quoted market price when available; however, because long-lived assets typically do not have active markets, managers may provide an estimate of fair value based on "the best information available in the circumstances." The impairment loss is then reported as a component of income from continuing operations.[7]

The above discussion reveals that substantial assumptions and estimates are generally required to implement SFAS 121. Thus, the standard's effect on managerial discretion exercised to arrive at reported write-offs is unclear. Similarly, the standard's criteria for determining an impairment (e.g., the use of undiscounted cash flows) may or may not enhance the mapping of economic declines into the reported decreases in asset values. Both of these ideas are developed further in the next section of the paper.[8]

A substantial accounting literature examines asset write-offs in the pre-SFAS 121 period.[9] This research reveals that write-offs generally have negative information content when announced, tend to be quite large in terms of absolute and percentage size, and tend to be reported in the fourth quarter (Elliott and Shaw [1988]; Zucca and Campbell [1992]; Francis, Hanna and Vincent [1996]). Francis, Hanna and Vincent [1996] also document that market reactions and incentives can vary by the type of write-off (e.g., inventory versus goodwill). Alciatore, Easton and Spear [2000] examine the timeliness of write-offs for oil and gas firms under the SEC's full-cost ceiling test, finding that write-offs have a significant negative association with contemporaneous quarterly returns and an even more negative association with

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[7] SFAS 121 specifically prohibits both restatement of previously issued financial statements as well as restoration of previously recognized impairment losses.

[8] The question of SFAS 121's effectiveness in enhancing the reporting of long-lived asset write-offs is further highlighted by the dissent of two of the seven FASB board members, reflecting the substantial debate surrounding the standard's passage, particularly regarding the measurement bases for determining the existence and amount of the impairment.

[9] Alciatore et al. [1998] provide a detailed literature review of accounting research relating to asset write-offs.

prior quarter returns. They conclude that such impairments are not timely, insofar as they are reflected in returns prior to the announcement of the write-off.

In addition, prior research examines the characteristics of firms taking write-offs before the issuance of SFAS 121, finding that write-off firms tend to underperform other firms within their industry in the periods both preceding and subsequent to the write-off (Elliott and Shaw [1988]; Zucca and Campbell [1992]; Rees, Gill and Gore [1996]). Results in Strong and Meyer [1987] and Francis, Hanna and Vincent [1996] suggest that firms recording write-offs are more likely to have changes in senior management. In addition, Elliott and Hanna [1996] provide evidence that firms taking write-offs are more likely to have additional write-offs in future periods, and that the earnings response coefficient is decreasing in the frequency of write-offs. Rees, Gill and Gore [1996] reveal that write-off firms record significant unexpected (or "abnormal") accruals (exclusive of the write-off) in the year of the write-down. However, they also find that these unexpected accruals do not reverse in subsequent years, suggesting the firms have experienced a permanent shift in their accrual balances in the write-off year. Finally, Bartov, Lindahl and Ricks (1998) find that firms recording write-offs exhibit significant abnormal returns for a two-year period following the write-off, suggesting market agents may not fully understand the economic consequences of write-offs.

Little research has examined write-offs reported in the post-SFAS 121 period. Comprix [2000] finds that for firms recording asset impairments under SFAS 121, book and market values are more closely aligned (i.e., nearer in value) after the write-off is taken. He also provides evidence that the market reaction to write-off announcements is conditioned by investors' view of the firm's ability to redirect its investments. No research has contrasted the reporting of write-offs across the pre- and post-SFAS 121 regimes.

3. Hypothesis Development and Research Design

3.1 Determinants of Long-Lived Asset Write-offs

The first analysis contrasts the determinants of write-off amounts across the pre-SFAS 121 and post-SFAS 121 regimes. Thus, this analysis examines the *relative* associations *across* the two regimes.[10] The reporting of asset impairments is conceptually a function of economic factors and reporting incentives. Thus, management will record an impairment if there is an observed economic decline in the value of the firm's asset(s) below carrying value. Similarly, in the absence of (enforceable) restrictions over the reporting of write-offs, management will choose to report an economic impairment if there are explicit (e.g., contractual) or implicit (e.g., perceived stock market effects) reporting incentives to do so.

As previously discussed, it is unclear how the associations between write-off amounts and economic factors, and the associations between write-off amounts and reporting incentives, change (if at all) upon adoption of SFAS 121. For example, economic factors may have a greater association with write-offs reported prior to the standard, as the structure for calculating and reporting impairments under SFAS 121 may not map into the underlying economic events (e.g., because the standard uses undiscounted cash flows as the trigger for impairment). Alternatively, economic factors may have a greater association with write-offs after the standard is adopted, as its guidance may enhance this mapping process. Concerning the association between write-off amounts and reporting incentives, these associations may be greater in the pre-SFAS 121 regime, if managers exercise greater discretion prior to the standard, which SFAS 121 reduces or eliminates. Alternatively, write-offs reported after adoption of the standard may have

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[10] This is in contrast to the *absolute* associations *within* each regime. While this latter analysis may be of interest in its own right, it is not the primary focus of the current study.

a greater association with reporting incentives, as the standard may enable managers to more easily justify their reporting choices as consistent with authoritative accounting rules relative to before the standard. The above competing possibilities result in the following two-tailed hypotheses (both stated in alternative form):

H_1: The association between reported write-off amounts and *economic factors* differs in the pre-SFAS 121 regime compared to the post-SFAS 121 regime.

H_2: The association between reported write-off amounts and *reporting incentives* differs in the pre-SFAS 121 regime compared to the post-SFAS 121 regime.

To implement this analysis, I use the following tobit regression, similar to Francis, Hanna, and Vincent [1996]: [11, 12, 13]

$$
\begin{aligned}
WOTA_{it} = Pre * & \begin{bmatrix} \phi_0 + \phi_1 \Delta GDP_t + \phi_2 \Delta INDROA_{it} + \phi_3 \Delta SALES_{it} + \phi_4 E_{it} + \phi_5 \Delta OCF_{it} \\ \phi_6 \Delta MGT_{it} + \phi_7 \Delta ENEG_{it} + \phi_8 \Delta EPOS_{it} + \phi_9 DEBT_{it} \end{bmatrix} \\
+ Post * & \begin{bmatrix} \rho_0 + \rho_1 \Delta GDP_t + \rho_2 \Delta INDROA_{it} + \rho_3 \Delta SALES_{it} + \rho_4 E_{it} + \rho_5 \Delta OCF_{it} \\ \rho_6 \Delta MGT_{it} + \rho_7 \Delta ENEG_{it} + \rho_8 \Delta EPOS_{it} + \rho_9 DEBT_{it} \end{bmatrix} + \zeta_{it}
\end{aligned}
$$
(1)

Eq. (1) represents the stacking of two regressions: the first where the observations are from the pre-SFAS 121 period, and the second where the observations are from the post-SFAS 121 period.[14] Thus, *Pre* is a dummy variable equal to 1 for observations occurring in the pre-SFAS

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[11] The use of the tobit specification is appropriate, assuming the data is censored: i.e., the explanatory (X) variables are available for all observations, but the explained (Y) variable is equivalent to 0 because it falls below some (unobserved) threshold value $Y*$ for a subset of observations (Maddala [1983]). However, as discussed in Section 4.2, alternative distributional assumptions may be made. Nonetheless, my results and inferences are robust to both the tobit and OLS specifications.

[12] This research design assumes the capacity to properly specify the regression to allow comparisons across the regimes. Note that implementation of SFAS 121 was a firm-specific event, which could vary from 1994 to 1997, depending on the firm's fiscal year and choice of early-adoption. Thus, the pre-SFAS 121 and post-SFAS 121 regimes overlap in calendar time (i.e., are not mutually exclusive time periods). This should partially mitigate potentially correlated shifts in the information environment that are not directly attributable to the new standard. The descriptive evidence presented in section 4.1 provides some additional support that these regimes are comparable.

[13] I could alternatively model this in a two-stage design, with the first stage capturing the decision to report a write-off, and the second to capture the amount. I choose not to do so, as I assume the two choices are simultaneous (and thus captured by the tobit design) and not sequential (as implied by the two-stage design).

[14] Following Maddala [1992], stacking refers to the placing of regressions 'on top' of one another as follows:

$$
\begin{pmatrix} Y_1 \\ Y_2 \end{pmatrix} = a_1 \begin{pmatrix} 1 \\ 0 \end{pmatrix} + a_2 \begin{pmatrix} 0 \\ 1 \end{pmatrix} + b_1 \begin{pmatrix} X_1 \\ 0 \end{pmatrix} + b_2 \begin{pmatrix} 0 \\ X_2 \end{pmatrix} + \begin{pmatrix} u_1 \\ u_2 \end{pmatrix}
$$

121 period (0 otherwise), and the ϕ coefficients measure associations between write-off amounts and the economic/reporting variables for the *pre-SFAS 121* observations. Similarly, *Post* is a dummy variable equal to 1 for observations occurring in the post-SFAS 121 period (0 otherwise), and the ρ coefficients measure the same associations for the *post-SFAS 121* observations. The stacking of the equations allows me to test for differences in coefficient estimates across the two regimes.

The dependent variable, $WOTA_{it}$, is the net of tax amount of the reported asset write-off (reflected as a <u>positive</u> number in this analysis) for firm i for year t, divided by beginning-of-period total assets.[15] I then include proxies to capture the underlying economic performance of the firm, with the variables chosen to reflect three levels of economic activity that may map into the value of the firm's assets: macro, industry, and firm-specific. To capture macro economic effects, I include ΔGDP_t, the percentage change in US Gross Domestic Product from year *t-1* to *t*. Negative changes in GDP are indicative of overall economic decline, suggesting firm assets may suffer concurrent diminutions in value; thus, I predict a negative association between write-offs and this variable within each regime. My second proxy, $\Delta INDROA_{it}$, captures industry-specific changes in the underlying economics. For example, firms in declining industries may record greater amounts of asset impairments, while those in expanding industries may record

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Because this technique will capture any (potential) correlations across the error terms, it enables statistical tests of coefficients across equations. The primary assumption underlying stacked regressions is that the error term from each regression has the same distribution. Under this assumption, stacking will result in consistent coefficient estimates. It may also provide efficiency gains, if there is non-zero correlation in the error terms across the stacked regressions.

[15] To obtain the net of tax write-off amount, I use explicit tax savings when available. For the remaining observations, I calculate estimated tax savings using the marginal tax rate proxy based on Graham [1996] (discussed in Section 4.2). As tax savings associated with the write-off are a required disclosure under SFAS 121, measurement error on this dimension should not be an issue for write-offs reported in this period. While measurement error on this dimension may be more pronounced for write-offs in the pre-SFAS 121 period, it is unclear whether such error should bias my analyses. Nonetheless, I also conduct my analyses using gross write-offs for both regimes, with no changes in the inferences.

lower write-offs. Similar to Francis, Hanna and Vincent [1996], I measure this construct as the

change in industry median return on assets over the prior year, using all firms within the same 2-

digit SIC code. As with ΔGDP_t, the expected sign is negative within each regime.

The third group of economic factors is intended to capture firm-specific changes in the

underlying economics that are associated with declines in asset value. I include three variables,

intended to capture both accrual and cash-related firm attributes. The first, $\Delta SALES_{it}$, is

measured as the percentage change in the firm's sales over the prior year.[16] The second variable

is E_{it}, the level of firm i's earnings for period t (measured before any long-lived asset write-

offs), divided by beginning of period total assets. The third, ΔOCF_{it}, is the change in the firm's

operating cash flows from period t-1 to t, divided by beginning of period total assets. All three

variables have predicted negative signs within each regime.

My second group of proxies is intended to capture explicit or implicit reporting

incentives managers may face in recording write-offs. Following Strong and Meyer [1987],

Pourciau [1993], and Francis, Hanna, and Vincent [1996], I include ΔMGT_{it}, a dummy variable

equal to 1 if the firm experiences a change in senior management from year t-1 to t, 0 otherwise.

I define "senior management" as any of the top three compensated positions within the firm,

identified via the *Executive Compensation* database. Consistent with the findings of the latter

studies, I expect a positive association between write-offs and changes in management within

each regime, as the new management may have incentives to take excessive charges, which can

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[16] I test two alternative definitions of *ΔSALES*: change in sales divided by total assets, and change in sales plus
change in accounts receivable divided by total assets. Inclusion of either alternative does not change the
inferences on any other variable. However, while the difference in *ΔSALES* continues to be negative as
presented, it is no longer significant (Z-statistic of −1.071 and −1.001, respectively). Note that, as discussed later,
because I am not applying weighted-least squares, the appropriate choice of scalar is unclear in this regression.

be blamed on the prior management regime, and thus create effective reserves for future performance.[17]

Other incentives may exist for managers to take write-offs. Kirschenheiter and Melumad [2002] present a model wherein a larger earnings surprise reduces the inferred precision of the earnings number, and thus dampens the effect on firm value. This creates a natural demand for managers to take "big baths," as the greater negative surprise has a reduced overall effect on firm value due to the lower inferred precision users attribute to it. This also provides a rational for managers to smooth earnings, as the reduction in positive earnings surprise similarly leads to greater inferred precision of the reported earnings construct. In both cases, this reporting behavior maximizes the value of the firm – consistent with managers using reporting flexibility to reveal their private information about the true underlying value of the firm. An alternative interpretation is that managers may use this reporting discretion in an opportunistic fashion. In this case, such "big bath" charges and/or earnings smoothing would serve to distort the underlying economics of the firm (e.g., Turner [2001]). The incentives managers have to increase (i.e., "big bath") or decrease (i.e., "smooth") the inferred precision of reported earnings may be explicit (e.g., maximizing long-term bonus payments to themselves) or implicit (e.g., maximizing shareholder value, or potential stock-related compensation).

To proxy for these general effects, I follow Bartov [1993] and Francis, Hanna and Vincent [1996] and include separate proxies for when earnings are "unexpectedly" high and when they are "unexpectedly" low. I first define ΔE as the change in earnings (measured *before* write-offs) divided by beginning-of-period total assets. $\Delta ENEG_{it}$ equals ΔE if ΔE is less than

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[17] Note that an alternative interpretation of this variable is a more economic story: that the new management is exercising greater scrutiny of the value of existing assets or changing the firm's strategic focus. However, to the extent the selected economic proxies already control for such underlying economic performance of the firm, any remaining component associated with a change in senior management may be considered a reporting incentive.

0, and 0 otherwise. Consistent with firms taking "big baths," I predict a negative association

between write-offs and $\Delta ENEG_{it}$ within each regime. Similarly, I define $\Delta EPOS_{it}$ as equal to

ΔE if ΔE is greater than or equal to 0, and 0 otherwise. Consistent with earnings smoothing, I

predict a positive association between write-offs and $\Delta EPOS_{it}$ within each regime. Separating

the variable allows for differing relations when the change in earnings is negative/positive;

however, to the extent these proxies do not reflect the (unobservable) discontinuity (i.e., the point

at which managers have incentives to smooth earnings versus "take a bath"), the underlying

construct is measured with error.[18]

The fourth reporting incentive variable examines the debt-covenant hypothesis, under

which firms are hypothesized to take income-increasing accounting decisions to avoid costly

violations of debt covenants (e.g., Watts and Zimmerman [1990]). While prior research has

employed financial ratios (such as debt-to-equity) to proxy for such effects, recent research casts

doubt on the validity of such proxies (see, for example, Fields, Lys and Vincent [2001]).

However, prior research suggests that private debt is more likely to have financial covenants than

publicly issued debt, likely reflecting the relatively greater cost of coordinating monitoring

efforts among the group of lenders that are typical of public debt issuances (Beatty, Dichev and

Weber [2002]). Therefore, I define $DEBT_{it}$ as a dummy variable equal to 1 for firm's whose

debt is private (i.e., not publicly rated by Standard and Poor's), and 0 otherwise. Because private

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[18] I could also include proxies for managerial compensation (e.g., bonus pay as in Healy [1985]). However, the results in prior research examining the association between compensation and "non-recurring" charges such as write-offs are unclear. Dechow, Huson, and Sloan [1994] find that CEO compensation is *increasing* in restructuring charges (which are similar, but not exactly the same, as the charges I examine); while Chen and Lee [1995] find evidence consistent with compensation committees in the oil and gas companies intervening to shield executive bonuses from reported write-offs. Thus, I choose a more general proxy.

debt is more likely to have covenants affected by write-offs (e.g., net worth, debt-to-equity), I

predict a negative association between write-offs and this variable within each regime.[19]

Eq. (1) also requires a control for differences in write-off amounts across the regimes that

may mechanically result from the implementation of SFAS 121 (e.g., if less netting occurs,

because assets now must be grouped at the lowest level of identifiable cash flows). Consistent

with the stacking of equations, I include separate intercepts for each set of observations to

control for any such differences. Thus, the interacted intercept, $Pre * \phi_0$, controls for any mean

effect associated with the amount of write-offs occurring in the pre-SFAS 121 regime, and

$Post * \rho_0$ controls for the same for the post-SFAS 121 observations. In addition, these variables

also control for any macro-economic shifts across the two regimes, to the extent such shifts also

have a mean effect.[20] Finally, implementation of this regression requires identification of a

group of 0 firms – that is, firms which do not report a write-off. I include all firms from the

same sample period, which have the necessary financial data but do not record a write-off.[21]

Following my two-tailed hypothesis 1, I compare the association between write-offs and

economic factors (i.e., ΔGDP_t, $\Delta INDROA_{it}$, $\Delta SALES_{it}$, E_{it} and ΔOCF_{it}) across the regimes by

testing whether $\phi_1 - \rho_1 \neq 0$, $\phi_2 - \rho_2 \neq 0$, etc. As the predicted signs for all my economic proxies

are negative within each regime, a significantly negative difference is consistent with write-offs

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[19] In section 4.2, I discuss the results using alternative definitions of *DEBT* as part of my sensitivity analyses.

[20] I also allow for more refined mean effects by including separate year dummies within each regime (and dropping *GDP*, as this variable is defined by year, and thus perfectly collinear with the time dummies). All inferences are unchanged by this specification, except the difference on *ΔINDROA* is now negative but insignificant (*Z*-statistic = - 1.394). The use of year dummies should also provide a partial control for other changes in the information environment that may coincide with SFAS 121. For example, the Private Securities Litigation Reform Act (enacted December 1995) made it more difficult for shareholders to sue companies for fraudulent financial reporting, and thus could bias in favor of my presented results. However, as noted in footnote 12, implementation of SFAS 121 was a firm-specific event, resulting in some overlap of the pre- and post-SFAS 121 regimes.

[21] Because I am not employing a "matching" design as in Francis, Hanna, Vincent [1996], this analysis will not require the adjustment for disproportionate (i.e., choice-based) sampling the latter paper refers to.

having a greater association with the tested economic factor in the pre-SFAS 121 regime. Alternatively, a significantly positive difference suggests write-offs have a greater association with the economic factor in the post-SFAS 121 regime. Concerning the reporting incentive variables (hypothesis 2), I will similarly test whether the coefficients are different across the regimes. Thus, for those variables where the predicted sign is negative within each regime (i.e., $\Delta ENEG_{it}$ and $DEBT_{it}$), a significantly negative difference suggests these reporting incentives have a greater association with write-offs in the pre-SFAS 121 regime, while a significantly positive difference suggests a greater association in the post-SFAS 121 regime. Finally, for those reporting incentive variables having predicted positive signs within each regime (i.e., ΔMGT_{it} and $\Delta EPOS_{it}$), a significantly positive difference is consistent with these reporting incentives having a greater association with write-offs in the pre-SFAS 121 regime, while a significantly negative difference suggests a greater association in the post-SFAS 121 regime.

Several issues relating to my choice of variables in Eq. (1) warrant discussion. First, note that I choose to examine this issue using ratios versus raw levels (e.g., my dependent variable is write-offs divided by total assets, versus write-offs). Because scale could have a significant effect on my regressions, the use of ratios should better accommodate these relationships.

Second, the set of variables included in Eq. (1) is clearly not exhaustive of the possible proxies available, particularly for my economic factors. Concerning this latter group, my variables are chosen to capture varying levels of activity that may map into write-offs (macro, industry, and firm-specific), as well as varying performance metrics (sales, earnings, and cash flows). With respect to factors that are (potentially) omitted from the regression, I note that their

effect must be orthogonal to the proxies I have chosen to affect my inferences.[22] Further, to the

extent these factors are similar across the two regimes, the difference research design (i.e., the

relative comparison across the regimes) should (partially) control for such omitted variables.

Finally, because write-offs are reported at the firm level, firm-specific proxies may provide the

most relevant attribute to assess economic impairments. However, I note that a fourth level of

economic activity warranting consideration would be *asset*-level characteristics. Unfortunately,

defining such variables in this context is difficult, either because the level of aggregation is

unavailable, or (if indicated) asset-specific attributes (e.g., sales, earnings, or cash flows) are

generally unavailable.

Third, all of the economic proxies, as defined, are backward-looking (i.e., they are

measured using information from prior and current periods). Alternatively, I could include

proxies measured over future periods (e.g., by measuring the change in cash flows from t to $t+1$,

versus from $t-1$ to t). I choose not to do so, principally because my dependent variable may have

a mechanical relationship with such variables. For example, write-offs likely map directly into

(presumably) reduced future cash flows or sales, calling into question the use of such forward-

measured variables in this context.

Finally, in contrast with prior research (Francis, Hanna, and Vincent [1996]), my

economic proxies do not include either a measure of the firm's history for taking prior write-offs,

or a market-based measure such as the firm's returns for prior periods. Concerning the former,

Elliott and Hanna [1996] provide evidence that firms recording write-offs are more likely to

record additional (future) write-offs, suggesting a firm's history of previous write-offs may

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[22] Note that the choice of variables also takes into account concerns for multicollinearity, which was an issue in the
Francis, Hanna and Vincent [1996] paper. However, multicollinearity does not appear to be a concern within my
specification: the highest variance-inflation-factor is less than 4.

represent a determinant of write-off amounts. However, implementing this variable within my context is problematic, as write-offs in the pre-SFAS 121 period could affect write-offs in the post-SFAS 121 period, resulting in an intermingling of regimes. Further, Elliott and Hanna state that their results are robust to the exclusion of a firm's history for taking prior write-offs, suggesting other proxies may suitably capture the underlying economics of the firm. Finally, my sample selection procedures (e.g., omission of the two-year transition period and random selection of one write-off observation per firm per regime – see section 4.1) should mitigate the effects of this potentially omitted variable.

Concerning the market-based measures, I exclude such variables, as their inclusion would appear to result in a logically inconsistent model. In particular, my second analysis examining the timeliness of asset write-offs (as well as prior studies investigating the information content of write-offs) suggests that write-offs are an *input* into the market's valuation of the firm. Thus, such market-based variables would be endogenous if included on the right-hand side of my write-off amount analysis. However, for both the history of prior write-offs and the market-based measures, to the extent the more primitive construct (i.e., the underlying value of the assets) is correlated with my chosen economic proxies, I have controlled for this effect.

3.2 Timeliness of Long-Lived Asset Write-offs

Easton [1999] discusses the use of equity markets as a benchmark to assess the timeliness of accounting information. Prior research has examined timeliness in this fashion (e.g., Collins et al. [1994], Alciatore, Easton, and Spear [2000]), generally studying the extent to which accounting amounts provide a summary measure of the information used by investors in setting prices. Consider how this research applies within the setting of long-lived asset write-offs. On

the one hand, prior to SFAS 121, management may use the available discretion over the timing

and amount of reported asset impairments to more effectively communicate their private

information. In addition, it is unclear whether SFAS 121 reduced (opportunistic) flexibility, or

that its guidelines (e.g., the required use of undiscounted cash flows) map into the underlying

economic events causing the decline in asset value. The latter ideas suggest the timeliness of

asset write-offs may be greater in the pre-SFAS 121 period. Alternatively, managers may have

used the reporting flexibility available prior to the standard opportunistically, with SFAS 121

reducing or eliminating such manipulation. Further, the standard may have enhanced the

reporting of such write-offs with its more structured guidance.[23] This discussion suggests the

timeliness of write-offs may be greater in the post-SFAS 121 period. These competing

possibilities result in the following two-tailed hypothesis, stated in alternative form:

H_3: The *timeliness* of write-off amounts differs in the pre-SFAS 121 versus post-SFAS 121 regime.

Testing this hypothesis requires operationalizing the financial characteristic "timeliness,"

which I define as the portion of the total two-period market response to the write-off that is

contemporaneous. Specifically, I construct a ratio representing the contemporaneous market

response to the contemporaneous write-off divided by the total two-period market response (i.e.,

the contemporaneous and lagged periods) to this same write-off. If the accounting system

perfectly captures and reports the write-off in a timely fashion (with respect to the stock market),

this ratio should approach a value of one, reflecting a fully contemporaneous market reaction.

Alternatively, if the accounting system does not record the write-off in a timely fashion, and the

market is able to assess the effects of the impairment on the value of the firm's assets through

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[23] For example, recall that paragraph 4 states an entity should test for an impairment "whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable."

other information sources, then this ratio will approach zero, reflecting the market's preempting of the recorded write-off.

I develop the empirical construct of timeliness in the following five steps. First, I begin with a differenced levels regression of market value of equity on book value of equity, assume clean surplus, and adjust the change in market value for dividends and capital contributions, resulting in:[24]

$$\Delta MV_{it} = \alpha_0^2 + \alpha_1^2 E_{it} + \varepsilon_{it}^2 \tag{2}$$

where ΔMV_{it} is the change in market value including dividends and capital contributions for firm i over period t, E_{it} is accounting earnings, and ε_{it} is an error term. My choice of a balance sheet framework as a starting point reflects that asset write-offs should serve to align the firm's net asset value closer to fair value (approximated by the market value of equity).

Second, prior research (e.g., Collins, et al. [1994]) provides evidence that the equity market anticipates future earnings, presumably by developing expectations of such amounts through other information. Assuming that the market incorporates a one-period lead of accounting earnings and that actual earnings proxies for the market's expectations, Eq. (2) may be written as:[25]

$$\Delta MV_{it} = \alpha_0^3 + \alpha_1^3 E_{it} + \alpha_2^3 E_{i,t+1} + \varepsilon_{it}^3 \tag{3}$$

Lagging Eq. (3) results in the following regression:

$$\Delta MV_{i,t-1} = \alpha_0^{3a} + \alpha_1^{3a} E_{i,t-1} + \alpha_2^{3a} E_{it} + \varepsilon_{i,t-1}^{3a} \tag{3a}$$

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[24] Note that the superscripts on the coefficients and error terms in Eqs. (2) - (3a) are used for preciseness, as the parameters across these equations are not econometrically equivalent.

[25] I can develop this model with any number of leads of accounting information without substantively changing my proxy for timeliness (shown in the fifth step). The use of a single lead of earnings allows me to explicitly relate the contemporaneous write-off to both the contemporaneous and lagged market response (as reflected in Eqs. (4) and (4a), respectively), and develop a more parsimonious model.

Third, similar to Alciatore, Easton and Spear [2000], my interest lies in the association between *contemporaneous* write-offs with the contemporaneous and lagged market response. Thus, I decompose E_{it} (contemporaneous earnings) in Eqs. (3) and (3a) into E^*_{it} (earnings before the write-off) and WO_{it} (the write-off, measured as a <u>negative</u> amount in this analysis).[26] I similarly decompose $E_{i,t+1}$ in Eq. (3) and $E_{i,t-1}$ in Eq. (3a), to obtain the following cross-sectional regressions:[27, 28]

$$\Delta MV_{it} = \beta_0^t + \beta_1^t E^*_{it} + \beta_2^t WO_{it} + \beta_3^t E^*_{i,t+1} + \beta_4^t WO_{i,t+1} + \varepsilon_{it} \tag{4}$$

$$\Delta MV_{i,t-1} = \beta_0^{t-1} + \beta_1^{t-1} E^*_{i,t-1} + \beta_2^{t-1} WO_{i,t-1} + \beta_3^{t-1} E^*_{it} + \beta_4^{t-1} WO_{it} + \varepsilon_{i,t-1} \tag{4a}$$

The 't' ('$t-1$') superscripts on the coefficients denote parameters estimated using the contemporaneous (lagged) market response as the dependent variable. Following Christie [1987], I redefine all the variables in Eqs. (4) and (4a) to be scaled by beginning market value of equity ($MV_{i,t-2}$). Thus, these equations are similar to the use of contemporaneous and lagged *returns* as dependent variables, except I use a common scalar across both equations. This allows me to focus on the association between write-offs and the change in market value without possibly confounding effects resulting from different scalars across the equations.

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[26] The write-off is measured net of the associated tax benefit, calculated as discussed in footnote 15.

[27] Similar to footnote 25, I can develop this model with any number of lags (or leads) of change in market value without substantively changing my timeliness proxy (e.g., I can add an Eq. (4b) with *ΔMV_{i,t-2}* as the dependent variable). I use the change in market value over only two time intervals (i.e., *ΔMV_{it}* in Eq. (4) and *ΔMV_{i,t-1}* in Eq. (4a)) as I expect that most of the market reaction would be captured within this two-year period, and to derive a parsimonious model.

[28] Note that my analysis is *cross-sectional* in nature. Thus, while Eqs. (4) and (4a) include both the contemporaneous write-off (i.e., *WO_{it}*) and lead/lagged write-offs (i.e., *WO_{i,t+1}* in Eq. (4) and *WO_{i,t-1}* in Eq. (4a)), my interest lies in how the *contemporaneous* write-off (*WO_{it}*) relates to my change in market value measures. The inclusion of the lead/lagged write-offs (which may have a zero value in my sample data) allows a consistent development of the model by enabling differing relations between earnings and write-offs across *all* represented time periods.

The below specifications, while highlighting my variable of interest (*WO_{it}*), are not consistently developed:

$$\Delta MV_{it} = \beta_0^t + \beta_1^t E^*_{it} + \beta_2^t WO_{it} + \beta_3^t E_{i,t+1} + \varepsilon_{it} \qquad \text{(alternative 4)}$$

$$\Delta MV_{i,t-1} = \beta_0^{t-1} + \beta_1^{t-1} E_{i,t-1} + \beta_2^{t-1} E^*_{it} + \beta_3^{t-1} WO_{it} + \varepsilon_{i,t-1} \qquad \text{(alternative 4a)}$$

Fourth, Eqs. (4) and (4a) may each be applied to two groups of observations: those from the pre-SFAS 121 period, and those from the post-SFAS 121 period. The stacking of these two groups of observations within each equation results in the following transformations:

$$\Delta MV_{it} = Pre * \left[\beta_0^t + \beta_1^t E*_{it} + \boldsymbol{\beta_2^t WO_{it}} + \beta_3^t E*_{i,t+1} + \beta_4^t WO_{i,t+1}\right]$$
$$+ Post * \left[\lambda_0^t + \lambda_1^t E*_{it} + \boldsymbol{\lambda_2^t WO_{it}} + \lambda_3^t E*_{i,t+1} + \lambda_4^t WO_{i,t+1}\right] + \varepsilon_{it} \quad (5)$$

$$\Delta MV_{i,t-1} = Pre * \left[\beta_0^{t-1} + \beta_1^{t-1} E*_{i,t-1} + \beta_2^{t-1} WO_{i,t-1} + \beta_3^{t-1} E*_{it} + \boldsymbol{\beta_4^{t-1} WO_{it}}\right]$$
$$+ Post * \left[\lambda_0^{t-1} + \lambda_1^{t-1} E*_{i,t-1} + \lambda_2^{t-1} WO_{i,t-1} + \lambda_3^{t-1} E*_{it} + \boldsymbol{\lambda_4^{t-1} WO_{it}}\right] + \varepsilon_{i,t-1} \quad (5a)$$

In both equations, *Pre* is a dummy variable equal to 1 for observations occurring within the pre-SFAS 121 period (and 0 otherwise), while *Post* is a dummy variable equal to 1 for observations occurring within the post-SFAS 121 period (and 0 otherwise). All other variables are defined as before, and the 't' ('t-1') superscripts continue to denote parameters from the regression using contemporaneous (lagged) market response as the dependent variable. The bolded items highlight my experimental variable (i.e., WO_{it}).

Notice that, consistent with the interpretation of stacked regressions, the β coefficients in Eqs. (5) and (5a) measure the associations between contemporaneous and lagged market response with the earnings/write-off amounts for the *pre-SFAS 121* observations, while the λ coefficients measure the same for the *post-SFAS 121* observations. Thus, one may compare the association between the contemporaneous market response (ΔMV_{it}) and contemporaneous write-off (WO_{it}) for the pre-SFAS 121 observations (i.e., β_2^t) with that for the post-SFAS 121 observations (i.e., λ_2^t). A similar comparison can be made for the lagged market response ($\Delta MV_{i,t-1}$) and contemporaneous write-off (WO_{it}), if the market is able to anticipate the write-off (thus, a comparison of β_4^{t-1} with λ_4^{t-1}). Assuming perfect alignment between the write-off

amount and the change in the firm's market value due to the decline in asset value, theory

suggests the coefficients relating write-offs to the market response should equal one. However,

measurement error and correlated omitted variables may result in biased coefficients, to the

extent the change specification has not differenced such specification issues away (see, for

example, Holthausen and Watts [2001]).

    This leads to the fifth and final step. Consistent with my earlier definition of timeliness,

the stacking of Eqs. (5) and (5a) allows me to examine the relative proportion of the market's

two-period response to the write-off that is contemporaneous.[29] The use of this construction

abstracts from measurement error issues discussed above, to the extent such issues are consistent

over the contemporaneous and lagged market responses *within each regime*. Restated, if β_2^t

from Eq. (5) measures the contemporaneous market response, and β_4^{t-1} from Eq. (5a) the lagged

market response, to the contemporaneous write-offs for the pre-SFAS 121 observations, then

their summation (i.e., $\beta_2^t + \beta_4^{t-1}$) captures the total two-period market response to these write-

offs. Further, the ratio, $\dfrac{\beta_2^t}{\beta_2^t + \beta_4^{t-1}}$, reflects the proportion of the total two-period market

response to the write-offs that is contemporaneous. The coefficients λ_2^t and λ_4^{t-1} measure the

same associations for the post-SFAS 121 observations, resulting in the ratio $\dfrac{\lambda_2^t}{\lambda_2^t + \lambda_4^{t-1}}$. Thus, my

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[29] My timeliness analysis, therefore, constitutes the stacking of the following four regressions:
    (1) contemporaneous market response (ΔMV_{it}) on contemporaneous write-offs (WO_{it}) (plus other variables) for the *pre-SFAS 121 observations*;
    (2) contemporaneous market response (ΔMV_{it}) on contemporaneous write-offs (WO_{it}) (plus other variables) for the *post-SFAS 121 observations*;
    (3) lagged market response ($\Delta MV_{i,t-1}$) on contemporaneous write-offs (WO_{it}) (plus other variables) for the *pre-SFAS 121 observations*; and
    (4) lagged market response ($\Delta MV_{i,t-1}$) on contemporaneous write-offs (WO_{it}) (plus other variables) for the *post-SFAS 121 observations*.

empirical test of hypothesis 3 is whether $\dfrac{\beta_2^t}{\beta_2^t + \beta_4^{t-1}} - \dfrac{\lambda_2^t}{\lambda_2^t + \lambda_4^{t-1}} \neq 0$.[30] A significantly positive

difference would suggest that write-offs in the pre-SFAS 121 regime are more timely than those

in the post-SFAS 121 regime, as a greater portion of the two-period market response for these

write-offs would be contemporaneous. Alternatively, a significantly negative difference would

suggest write-offs reported in the post-SFAS 121 regime are more timely.

A final issue concerns the measurement of my dependent variables, ΔMV_{it} and $\Delta MV_{i,t-1}$.

Both are measured over the respective one-year period ending three months after the firm's fiscal

year-end to ensure the market obtains the relevant financial information (e.g., the firm's annual

report). However, potential information releases relating to write-offs occurring prior to my

window could introduce noise into these variables. For example, a calendar-year end firm may

announce in December of year *t-1* that a write-off will occur in the first quarter of year *t*,

resulting in my misclassification of the market response to the earlier year. To mitigate such

measurement problems, I search Dow Jones News Retrieval for announcements of my write-off

observations (particularly focusing on any write-offs recorded in the first fiscal quarter). This

allows me to identify if information concerning the write-off was released earlier, and I

accordingly expand my change in market value window to encompass such releases.

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[30] Maddala [1992] and Greene [1997] discuss the derivation of the test statistic for such non-linear parameter
restrictions. The primary assumption underlying the statistic is that the standard error of the non-linear
combination can be evaluated at the estimated standard error values for each parameter. See Greene [1997]
pages 360-363.

4. *Empirical Results*

4.1 Sample Selection, Industry Composition, and Descriptive Data

Table 1 presents the sample selection process. I first identify the available firm-years during the sample period 1992-1998 having the necessary Compustat/CRSP data and not falling within the banking or financial services industries (i.e., SIC 6000). This results in 22,739 available observations (representing 5,474 firms), from which I construct a random sample of 5,180 firm-years (1,249 firms).[31] I then access the 10-K or annual report using Disclosure Global Access, and hand-collect the amount and characteristics of any recorded long-lived asset write-offs, as well as the implementation year of SFAS 121.[32] Of the 5,180 observations, 2,219 are excluded due to: the 10-K and annual report being unavailable; the observation consisting of a bankrupt, full cost, or start-up firm; or the observation falling within the two-year transition period.[33] Concerning the transition period, which accounts for approximately 75% of the excluded firm-years, I exclude any observations occurring in the year of and immediately preceding the firm's adoption of SFAS 121 for the following reasons. First, this mitigates self-selection issues relating to firms that may elect early-adoption of the standard, as well as issues relating to firms learning to implement the standard in the first year of its adoption. Second, because the analyses require lag and lead amounts of write-offs directly (in the timeliness analysis) and indirectly (i.e., through the definition of certain variables in the amount analysis,

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[31] My selection of a random sample is due to the cost of hand-collecting various data for my sample firms.

[32] Prior research has used Compustat's special items field (when negative) to capture write-off activity. I choose to hand-collect this data because (1) the special item category includes expenses and gains besides write-offs, and (2) it is not unusual for firms to group write-offs within other categories (e.g., cost of goods sold or selling, general and administrative), leading to possible confounds in my dependent variable were I to use the Compustat field. Nonetheless, I examine the correlation between *WOTA* and the special items category: 64% for the pooled, 84% for the pre-SFAS 121, and 53% for the post-SFAS 121 write-off observations. The correlations, while high, suggest benefits (particularly for the post-SFAS 121 observations) to more rigorously collecting this variable.

[33] The exclusion of full-cost firms within the oil industry reflects the requirement for these firms to record asset impairments consistent with the SEC's full-cost ceiling test under Regulation SX 4-10. In contrast, successful efforts firms are required to apply the rules specified in SFAS 121. See Alciatore, Easton, and Spear [2000].

such as $\Delta ENEG_{it}$), this selection process avoids (potentially) intermingling write-offs from both

regimes within a single observation, and should result in a better specification for my analyses.

Finally, for firms recording multiple write-offs during my sample period, I randomly select one

write-off per firm per regime, resulting in the elimination of 207 write-off observations. This

should reduce potential auto-correlation between my write-off observations, particularly given

the exclusion of the two-year transition period. Thus, the final sample for the analysis of the

determinants of write-offs consists of 2,754 firm-year observations, comprised of 455 write-off

(397 firms) and 2,299 non-write-off observations (919 firms). The final sample for the

timeliness analysis is 486 write-off observations, representing 422 firms.[34]

Table 2 provides various industry breakdowns for the sample observations. Consistent

with the random selection of firms, the industry composition of the available population (column

1) quite closely parallels that of the final sample (column 2), with slightly higher representation

in the final sample in electronic equipment (SIC 36) and business services (SIC 73), and lower

representation in oil and gas (SIC 13) and chemicals (SIC 28).[35] The table also reveals that the

non-write-off (column 3) and write-off (column 4) observations are similarly represented, with

write-offs occurring more frequently in chemicals (SIC 28), electronic equipment (SIC 36) and

eating and drinking (SIC 58), and less frequently in communications (SIC 48). The primary

industries in which write-offs occur within the sample are chemicals (SIC 28), industrial

machinery (SIC 35), electronic equipment (SIC 36), instruments (SIC 38), and business services

(SIC 73), which together account for approximately 45% of the sample write-off observations.

Finally, the table reveals that the pre-SFAS 121 (column 5) and post-SFAS 121 (column 6)

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[34] The number of write-off observations is unequal for the amount and timeliness analyses due to differing data
requirements.
[35] The lower representation in the oil and gas industry is likely due to my exclusion of full cost firms, as discussed
in footnote 33.

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write-off observations have similar industry compositions, with a higher occurrence in the oil and gas (SIC 13) and electric (SIC 49) industries for the pre-SFAS 121 observations, and higher occurrence in the chemicals (SIC 28) and business services (SIC 73) industries for the post-SFAS 121 observations.

Several untabulated descriptive statistics relating to the write-off observations warrant mentioning, particularly to provide further assurance that the sub-samples are comparable across the pre-SFAS 121 and post-SFAS 121 regimes. For all write-off observations, I hand-collect the following information: the quarter in which the write-off was reported; the nature of the assets written off (intangibles/goodwill, PPE, oil properties, capitalized software/hardware, or investment); the level at which the firm's assets were grouped in determining the write-off (to the extent it could be identified in the annual report and/or footnote disclosures); the primary depreciation policy followed by the firm; and whether the firm was simultaneously engaged in a restructuring. The quarter of the recorded expense could be identified for approximately one-half of the write-off observations as follows: 4%, 18%, 20%, and 58% are recorded in the 1st, 2nd, 3rd, and 4th quarters, respectively. This distribution is similar across the pre-SFAS 121 and post-SFAS 121 regimes. The nature of the assets written off is also similar across the regimes, with less frequent write-offs of on-balance sheet intangibles (e.g., goodwill and patents) occurring in the pre-SFAS 121 regime (22% versus 31% in the post-SFAS 121 regime). Somewhat surprisingly, the level of aggregation appears slightly *higher* for write-offs in the post-SFAS 121 regime (e.g., 25% appear to have recorded write-offs at the subsidiary level, while only 18% did so in the pre-SFAS 121 regime), though a greater percentage were undeterminable for the pre-SFAS 121 regime (27% versus 18% in the post-SFAS 121 regime).[36] A substantial majority of

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[36] In interpreting the level of aggregation, an important caveat is that the true level of identifiable cash flows available to management in evaluating the assets for impairment is unobservable. Thus, 25% at the subsidiary

the firms in both regimes use the straight-line method of depreciation (87% in the pre-SFAS 121 and 91% in the post-SFAS 121 regimes), suggesting a significant change in depreciation policy did not occur coincident with the adoption of SFAS 121.[37] Finally, a greater percentage of pre-SFAS 121 write-off observations reported a restructuring concurrent with the write-off (61%) as compared to the post-SFAS 121 observations (48%).

4.2 Empirical Results: Determinants of Long-Lived Asset Write-offs

Table 3 presents descriptive statistics for the observations used in the analysis of write-off amounts. Panel A partitions the write-off observations by those occurring in the pre-SFAS 121 ($N = 190$) and post-SFAS 121 ($N = 265$) regimes. As reflected in the variable *WOE*, write-offs appear to be significant economic events, representing 36% (23%) of pre-write-off earnings at the median in the pre-SFAS 121 (post-SFAS 121) regime. In both regimes, write-off firm-years typically have negative changes in pre-write-off earnings, reflected in the negative median values for $\Delta ENEG_{it}$ of -0.0153 in the pre-SFAS 121 and -0.0139 in the post-SFAS 121 period. Panel B provides descriptive statistics for the non-write-off observations, partitioned by pre-SFAS 121 ($N = 1,258$) and post-SFAS 121 ($N = 1,041$). The observations appear comparable for most variables, except $\Delta INDROA_{it}$ is lower at the mean and median and ΔMGT_{it} is greater for the post-SFAS 121 observations. Finally, Panel C provides descriptive statistics partitioned by the pooled write-off ($N = 455$) and non-write-off observations ($N = 2,299$). Consistent with prior research, untabulated results (examining both mean and median differences) reveal that write-off

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level in the post-SFAS 121 regime, should not, in and of itself, be considered a "worse" level of aggregation than the 18% within the pre-SFAS 121 regime, as each may have been performed at the correctly applied lowest level. Further, it is unclear *ex ante* that performing write-off analysis at the lowest level provides the strongest mapping of economic factors and/or reporting incentives.

[37] However, I have not examined whether firms systematically changed expected useful lives of assets across the two regimes.

firms exhibit worse financial performance than non-write-off firms within each regime, reflected in significantly lower $\Delta INDROA_{it}$, $\Delta SALES_{it}$, E_{it}, and ΔOCF_{it}. Untabulated results also indicate that write-off firms have higher rates of turnover in senior management (though these differences are significant only in the post-SFAS 121 regime), as well as significantly more negative $\Delta ENEG_{it}$ within both regimes. Table 4 presents the related Pearson correlations for the pre-SFAS 121 (Panel A), post-SFAS 121 (Panel B), and pooled (Panel C) observations.

Panel A of Table 5 presents the results for the tobit analysis examining the determinants of write-off amounts. The model's overall explanatory power has an adjusted-R^2 of 8.5%, comparable to that found in Francis, Hanna and Vincent [1996]. Of the economic factors in the pre-SFAS 121 regime, ΔGDP_t (Z-statistic = - 3.171), $\Delta INDROA_{it}$ (Z-statistic = - 3.156), $\Delta SALES_{it}$ (Z-statistic = - 2.935), and E_{it} (Z-statistic = - 5.017) are significantly negative as predicted. Only E_{it} (Z-statistic = - 1.957) is significantly negative in the post-SFAS 121 regime; ΔGDP_t (Z-statistic = - 0.606), $\Delta INDROA_{it}$ (Z-statistic = - 1.263), and $\Delta SALES_{it}$ (Z-statistic = - 1.159), while of the correct sign, are insignificant. ΔOCF_{it}, while of the correct sign in both regimes, is insignificant in the pre-SFAS 121 (Z-statistic = - 0.490) and post-SFAS 121 (Z-statistic = - 0.265) regimes.

For the reporting incentive proxies, in the pre-SFAS 121 regime, only $DEBT_{it}$ (Z-statistic = - 3.232) is significantly negative as predicted. ΔMGT_{it} (Z-statistic = 0.631) and $\Delta ENEG_{it}$ (Z-statistic = - 1.268) have the predicted positive and negative signs, respectively, but are insignificant. $\Delta EPOS_{it}$ is also insignificant (Z-statistic = - 0.840). In the post-SFAS 121 regime,

ΔMGT_{it} (*Z*-statistic = 1.865), $\Delta ENEG_{it}$ (*Z*-statistic = - 5.627), and $DEBT_{it}$ (*Z*-statistic = - 1.702) are significant in the predicted direction; while $\Delta EPOS_{it}$ (*Z*-statistic = - 0.698) is insignificant.

As previously discussed, my hypotheses are stated in terms of the relative associations between write-offs and the economic factors/reporting incentives across the regimes. Thus, concerning hypothesis 1 examining economic factors, a comparison of the coefficients across the regimes reveals significantly negative differences for ΔGDP_t of – 12.995 (*Z*-statistic = - 1.814), $\Delta INDROA_{it}$ of – 6.840 (*Z*-statistic = - 1.703), $\Delta SALES_{it}$ of – 0.202 (*Z*-statistic = - 2.143), and E_{it} of – 0.831 (*Z*-statistic = - 3.038). The difference for ΔOCF_{it} is insignificant (*Z*-statistic = 0.181). Because the predicted sign for all of the economic factors is negative within each regime, the above significantly negative differences suggest that all levels of economic factor (i.e., macro, industry, and firm-specific) have relatively higher associations with write-offs reported prior to SFAS 121, as compared to those reported after implementation of the standard.

Relating to hypothesis 2 examining reporting incentives, only my proxy for "big bath" behavior has a significantly positive difference of 1.412 (*Z*-statistic = 3.010). Because $\Delta ENEG$ has a predicted negative sign within each regime, this is consistent with write-offs in the post-SFAS 121 regime having a greater association with "big bath" reporting behavior than those reported pre-SFAS 121. The differences for the remaining reporting incentives are insignificant.

The associations discussed above suggest the following inferences. First, the consistently greater association between write-offs and economic factors in the pre-SFAS 121 regime is consistent with a weaker mapping of the underlying economics into reported write-offs upon adoption of SFAS 121, providing some support for critics of the standard. In addition, the greater association between write-offs and the "big bath" reporting variable in the post-SFAS 121 regime suggests managers are applying greater reporting flexibility in the determination of

reported write-off amounts subsequent to the adoption of SFAS 121. However, this latter result

has two possible interpretations. First, managers may be using the flexibility opportunistically,

and reporting excessive charges coincident with write-offs that are not a true reflection of the

underlying economics of their firms. This would be consistent with anecdotal evidence

suggesting managers undertake such charges to create possible reserves for future earnings, and

with the position taken by critics of the standard. Alternatively, the greater reporting flexibility

may reflect that managers are using such charges to provide a signal that maps more directly into

the true underlying performance of the firm. This would be consistent with the position

presented in Kirschenheiter and Melamud [2002]. However, the tests as constructed do not

distinguish between these two interpretations.

    Sensitivity Analyses – The Tobit Specification. Several issues regarding the above

inferences warrant further discussion. The first concerns the appropriateness of the tobit

specification within this context. While prior accounting research has used this specification to

examine write-offs (Francis, Hanna, and Vincent [1996]), it does not explicitly discuss its

implications and interpretations. The tobit model, as initially used by Tobin [1958], assumes that

the dependent variable has a number of observations clustering at a limit value, typically zero. In

other words, this model is appropriate when the dependent variable is censored, i.e., non-

observable below some threshold (Maddala [1983, 1991]).[38] However, Maddala distinguishes

this from the situation wherein a (significant) subset of observations have a dependent variable

with a (true) value of zero, as the latter is not necessarily indicative of a censored distribution. In

the current context, the latent variable assumed under the tobit specification is the change in the

value of the firm's assets, i.e., both reported decreases (write-offs) *and* increases ("write-ups") in

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[38] This is distinct from the truncated regression model, wherein *neither* the dependent nor independent variables are
    observed if y is below (or above) a threshold c.

the values of firm's assets. Restated, the (presumably healthier) firms, for which I observe write-off values of zero in my sample data, could conceptually record *increases* in the carrying values of their assets; and these increases constitute that portion of the distribution of the (censored) dependent variable, which the tobit specification attempts to fill in. However, it is possible that some or even all of the my non-write-off observations have true values of zero. Under this alternative assumption, the distribution may not be censored, suggesting OLS may be the appropriate specification. Following this perspective, Panel B of Table 5 presents the analysis of write-off amounts under OLS, with inferences that are quite similar to those under the tobit specification. Specifically, write-off amounts in the pre-SFAS 121 period continue to have a greater association with economic factors, and a lower association with "big bath" reporting incentives, than those reported in the post-SFAS 121 regime.

In addition, alternative interpretations are possible from the estimated parameters obtained from a tobit specification. As discussed in McDonald and Moffitt [1980], tobit parameter estimates may be interpreted in three ways.[39] First, the untransformed parameters provide inferences with respect to the latent variable of interest: as discussed above, the latent variable in the current context is the change (both positive and negative) in asset values that could be reported. Second, applying some algebra to the untransformed parameters allows inferences with respect to the change in the value of the dependent variable for those observations already above the limit (i.e., changes in the reported write-offs, for the write-off observations). Finally, through additional algebra, the parameters also provide inferences with respect to changes in the probability of being above the limit for those observations at the limit (i.e., changes in the probability of reporting a write-off for the non-write-off observations). The

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[39] Roncek [1992] provides a good illustration of the calculations required to derive these transformed parameters.

derivations for each transformation are provided in the notes to Table 6. This table also presents

the parameter estimates for the pre-SFAS 121 and post-SFAS 121 regimes, as well as the

differences across them, for each of the three above scenarios. The inferences appear consistent

across all derivations. In addition to the untransformed parameters previously discussed in the

main results (columns 1 - 3), the economic factors have consistently stronger (i.e., more

negative) associations with write-offs in the pre-SFAS 121 regime for both the transformed

parameters relating to changes in the dependent variable for the non-limit (i.e., write-off)

observations (columns 4 - 6) and those relating to changes in the probability of reporting a write-

off for the limit (i.e., non-write-off) observations (columns 7 - 9). Similar inferences occur for

the "big bath" reporting incentive.

Sensitivity Analyses – Interpretation of ΔENEG. A second inferential issue concerns the

interpretation of *ΔENEG* as a proxy for reporting incentives. In particular, this construct may

alternatively be capturing the underlying economic performance of the firm. In this case, the

significantly positive difference across the regimes for this variable would suggest that write-offs

in the post-SFAS 121 regime have a greater association with (this particular) economic factor

than those in the pre-SFAS 121 regime. I address this in several ways. First, I note that this

interpretation appears less likely, given the consistently opposite inferences for all the other

economic factors (including earnings in the levels). Thus, it is unclear why *ΔENEG* would

suggest an opposite inference to these other proxies, unless it is picking up the intended reporting

incentive effect.

Second, I attempt to better specify *ΔENEG* by refining this proxy. Such analysis is

warranted if the variable as measured in the primary analysis does not capture the relevant range

in which managers have the greatest incentives to engage in this behavior. For example, a firm's

pre-write-off earnings may decrease from 100 in period *t-1* to 90 in period *t*, with (unscaled) *ΔENEG* equaling –10. However, the firm's earnings is still in positive space, calling into question whether this would be a situation wherein a manager would have incentives to take a "big bath." Thus, I add *ΔENEG_MED* to Eq. (1), equal to *ΔENEG* when it is below the median of non-0 values of *ΔENEG*, to allow for a kinked relationship for this range of negative changes in earnings. This additional proxy should better capture the range in which managers have the greatest incentives to engage in "big bath" behavior. The difference for *ΔENEG_MED* is significantly positive (*Z*-statistic = 3.231), which provides corroborating evidence that write-offs in the post-SFAS 121 regime have a greater association with "big bath" reporting behavior than those in the pre-SFAS 121 regime. The inferences on the other variables are unchanged, both within and across the regimes, except the difference on *ΔINDROA* continues to be negative, but is now insignificant (*Z*-statistic = - 1.470). Similar results obtain when I alternatively define the additional variable to equal *ΔENEG* when it is below the first quartile of non-0 values of *ΔENEG* (*Z*-statistic on the difference = 2.765). Finally, the results are also consistent when I redefine *ΔENEG* to equal the change in the firm's pre-write-off earnings, when negative, for those firms also having a negative level of pre-write-off earnings in period *t*, and 0 otherwise (*Z*-statistic on the difference = 2.395). The combined evidence suggests this variable is more likely picking up reporting incentives, as opposed factors associated with the underlying economics of the firm.

Sensitivity Analyses – The Level of Asset Aggregation. The greater association between write-offs and the economic proxies for the pre-SFAS 121 write-offs may alternatively reflect that write-offs under SFAS 121 are calculated at a lower level of asset than prior to the standard; and my proxies, which do not capture asset-specific characteristics, are reflecting this. While this alternative explanation cannot be completely ruled out, there are reasons to believe that this

is not the case. First, as discussed previously, I review the disclosures provided in the annual reports of the sample write-off firms to obtain the level of asset aggregation at which the write-offs are calculated. This review reveals that the level of aggregation appears potentially *higher* after SFAS 121 came into effect. Further, the survey evidence of write-offs in the pre-SFAS 121 period (see footnote 4) suggests many firms may already have been calculating write-offs at the lowest level of identifiable cash flows, as prescribed under SFAS 121.

Sensitivity Analyses – Tax Minimization Hypothesis. Strong and Meyer [1987] posit that when firms have significant discretion over the timing of write-offs, those firms having higher marginal tax rates may be more likely to record a write-off, i.e., the tax minimization hypothesis. I explore this by adding TAX_{it} to Eq. (1), a variable intended to proxy for the unobservable marginal tax rates for each firm.[40] Following Graham [1996], this is a trichotomous variable, measured as (a) the top statutory tax rate if the firm has *neither* a net operating loss (NOL) carryforward nor negative taxable income (before the write-off); (b) one-half the top statutory tax rate if the firm has *either* a NOL carryforward or negative taxable income, but not both; or (c) zero if the firm has *both* a NOL carryforward and negative taxable income. The predicted sign is positive within each regime, reflecting that firms with higher marginal tax rates will have greater incentives to take a write-off.

However, the analyses reveal that TAX_{it} is significantly *negative* within both the pre-SFAS 121 (*Z*-statistic = - 4.410) and post-SFAS 121 (*Z*-statistic = - 2.352) regimes. One possible reason for this opposite to expected finding is that this variable captures economic

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[40] The inclusion of a tax-minimization proxy would suggest that I should measure my dependent variable gross, versus net of tax. However, I choose the latter measurement as this likely captures the strongest mapping of the economic factors and other reporting incentives into the write-off amounts. Nonetheless, the use of gross write-offs as the dependent variable in this sensitivity analysis does not change the results on either *TAX* or the other variables.

effects, as opposed to proxying for tax minimization. In particular, better performing firms (likely) have higher tax rates and thus fewer write-offs, suggesting it may be difficult to obtain a proxy that distinguishes between the economic effect versus this reporting incentive. In addition, due to more stringent requirements in the U.S. tax code, write-offs of long-lived assets often do not have an effect on current tax expense; rather, any tax savings tend to flow into the firm's deferred tax account, suggesting tax minimization may not be a first-order effect for this reporting event. Finally, the difference in the coefficients across the regimes is significantly negative (Z-statistic = - 1.717). Thus, if this variable is capturing economic effects, then its interpretation is consistent with all other economic proxies: that write-offs in the pre-SFAS 121 period have a higher association with this economic factor than those in the post-SFAS 121 period. The inferences on all other variables within and across the regimes are unaffected by the inclusion of TAX_{it}, except the difference on E_{it} remains negative but is insignificant (Z-statistic = - 1.461). Similar results obtain when TAX_{it} is defined as a dummy equal to 1 when the firm has a net operating loss carryforward, 0 otherwise.

$\quad$ *Sensitivity Analyses – DEBT.* I also examine alternative definitions of *DEBT* to further explore the debt covenant hypothesis. First, I build upon the *DEBT* variable in Eq. (1) by refining it to equal the debt-to-equity ratio when the firm has private debt, under the assumption that firms with private debt are more likely to have covenants, and those with higher debt-to-equity ratios are more likely to benefit from avoiding write-offs. While the redefined variable is negative as predicted in both regimes, it is insignificant in either the pre-SFAS 121 (Z-statistic = - 0.836) or post-SFAS 121 (Z-statistic = - 0.413) regimes, as is the difference (Z-statistic = - 0.501). Inferences on all other variables within and across regimes are unchanged across this alternative specification.

Second, I redefine *DEBT* as a dummy variable equal to 1 for debt that is not investment grade, and 0 otherwise. Restated, *DEBT* equals 1 if the debt is private or if it is public and rated below BBB by Standard and Poor's. Prior research (Beatty, Dichev and Weber [2002]) suggests investment grade debt is less likely to have covenants due to its perceived higher quality, thus this alternative definition also has a predicted negative sign within each regime. However, the results show *DEBT* to be significantly positive in the pre-SFAS 121 regime (Z-statistic = 1.866), and positive but insignificant in the post-SFAS 121 regime (Z-statistic = 0.876), with the difference also insignificant (Z-statistic = 0.786). The inferences on the other variables, within and across regimes, are unaffected. The positive sign on *DEBT* under this specification may reflect its capturing financial distress, as firms with lower credit ratings (i.e., below investment grade) are likely performing worse financially, and thus reporting more write-offs.

Finally, I redefine *DEBT* as a dummy variable equal to 1 if the firm-year has financial covenants, 0 otherwise. This information is hand-collected for each observation by examining the debt footnotes in the 10-K or annual report. While all inferences on the other variables are unchanged, *DEBT* takes the incorrect sign under this specification under both the pre-SFAS 121 (Z-statistic = 1.009) and post-SFAS 121 (Z-statistic = 3.207) regimes, with the difference negative but insignificant (Z-statistic = - 1.487). Somewhat surprisingly, the correlation between this *DEBT* variable (defined as 1 if the firm has financial covenants) and *DEBT* in the initial regression (defined as 1 if the firm has private debt) is quite low: 6% for the pre-SFAS 121 observations; 12% for the post-SFAS 121 observations; and 9% for the pooled observations.

4.3 Empirical Results –Timeliness of Long-Lived Asset Write-offs

Table 7, Panel A presents the descriptive statistics for the write-off observations used in the timeliness analysis, partitioned into the pre-SFAS 121 and post-SFAS 121 regimes. Panel B presents the Pearson correlations, with the univariate statistics (somewhat surprisingly) indicating that none of the write-off variables (including my experimental variable, WO_{it}) are significantly related to either the contemporaneous (ΔMV_{it}) or lagged (ΔMV_{it-1}) market response.

Panel A of Table 8 presents the OLS results of the timeliness analysis of the four stacked equations. The model exhibits explanatory power typical of such market return studies, with an adjusted-R^2 of 7.9%. All pre-write-off earnings amounts are positive and generally significant, though the results for these variables in the pre-SFAS 121 regime appear weaker than might be expected. Concerning my experimental variable (WO_{it}), within the pre-SFAS 121 regime it is negative and insignificant when related to ΔMV_{it} (t-statistic = - 0.089), and positive but insignificant when related to ΔMV_{it-1} (t-statistic = 1.047). Within the post-SFAS 121 regime, WO_{it} is positive but insignificant when related to ΔMV_{it} (t-statistic = 0.206), and positive and significant when related to ΔMV_{it-1} (t-statistic = 2.134). Panel B of Table 8 presents the Wald test of the non-linear parameter restriction comparing the portion of the two-period market response that is contemporaneous across the two regimes. The test fails to reject (probability = 0.85), and thus does not provide evidence of a difference in the timeliness of asset write-offs across the two regimes.

The relatively weak associations between the market response variables and the write-offs is surprising, as prior research has generally documented significantly positive relationships with returns in short-window (i.e., information content) settings (e.g., Elliott and Hanna [1996], Francis, Hanna and Vincent [1996]). Further, significant positive associations between write-

offs and returns have also been documented in a longer-window (i.e., quarterly) setting (Alciatore, Easton, and Spear [2000]), though this latter study examines a different write-off test (the SEC full-cost ceiling test), which is unique to a specific group of firms (the oil and gas industry), and is examined over a particular period (the collapse of oil prices during the end of 1985 and beginning of 1986). Thus, one (possible) explanation for the weak associations in the current study is that my assumption of cross-sectionally constant effects over a long window results in a weak specification, and thus a lack of power to detect the associations found in prior studies. Further, the associations between earnings and stock prices have generally been found to be weak for firms performing negatively (defined in various ways – see, for example, Hayn [1995]). Because write-off firms may be more likely to have this characteristic, this represents a second possible explanation.

However, to provide some validation for the model presented in Table 8, I conduct several sensitivity tests examining the associations between the market response variables and the pre-write-off earnings and write-off amounts. First, I examine the associations between my market response variables and the pre-write-off earnings variables, as the relations documented in Table 8 appear somewhat weaker than might be expected, particularly for the pre-SFAS 121 observations. As Table 9 shows, when only the respective contemporaneous earnings variable is included (columns 1 and 5), the earnings construct is positive and highly significant in all four specifications (i.e., pre-SFAS 121 and post-SFAS 121 with ΔMV_{it} and ΔMV_{it-1} as dependent variables). In addition, when both the respective contemporaneous and a lead of earnings are included (columns 2 and 6), all amounts are also significantly positive, except for one specification (the pre-SFAS 121 observations using ΔMV_{it} as the dependent variable). Similarly, I then examine the association between the market response variables and the write-offs

(columns 3-4 and 7-8). While the coefficients are all positive as predicted, they are generally insignificant (the standard errors on these variables are quite high). Nonetheless, the coefficient values and significance levels appear (directionally) more consistent with prior literature, suggesting a second possible explanation for the weak results in Table 8 is that the pre-write-off earnings may be absorbing the effect in this analysis. Finally, I also investigate these relationships by partitioning based on positive and negative pre-write-off earnings levels, as prior research provides evidence of differing associations between returns and earnings on this dimension (e.g., Hayn [1995]). While untabulated results provide evidence consistent with the findings of prior research with respect to the earnings construct (i.e., the associations between returns and earnings are larger in magnitude and have higher significance for firms with positive earnings), this partition does not provide additional insights regarding the write-off variables.

5. Conclusion

This paper contrasts the characteristics of reported asset impairments across two regimes: pre-SFAS 121 and post-SFAS 121. While the FASB issued SFAS 121 intending to enhance the financial reporting for long-lived asset impairments, the standard's effect on the characteristics of reported write-offs (including the related managerial flexibility applied in determining the amount and timing of these write-offs) is unclear *a priori*, owing in part to the inherently subjective assumptions and estimates required for implementation. Further, the effects of reporting flexibility on information presented to financial statement users is also unclear, as managers may use flexibility either opportunistically or to communicate private information.

I conduct two primary analyses contrasting reported write-offs across the regimes. The first examines whether the associations between write-off amounts and economic factors, as well

as the associations between write-off amounts and reporting incentives, differ across the pre-SFAS 121 and post-SFAS 121 periods. The second is a market-based analysis, which examines whether the timeliness of write-offs differs across these two regimes. Evidence from the first analysis suggests that write-offs reported prior to the standard have a greater association with macro, industry, and firm-specific economic factors, and lower association with "big bath" reporting incentives, relative to those reported in the post-SFAS 121 regime. These results are robust to various variable definitions and specifications. However, results from the second analysis fail to provide evidence of a difference in the timeliness of write-offs across the two regimes.

These results suggest that the underlying economics of the firm have a weaker mapping into write-offs reported under SFAS 121, as opined by critics of the standard. The results also indicate that managers are applying greater flexibility in the reporting decisions relating to write-offs after adoption of the standard. However, this latter result may be interpreted in two ways. First, managers may be distorting the underlying economics of their firms, and thus reporting opportunistically, consistent with anecdotal evidence that such "big bath" behavior reflects excessive charges to free up future earnings capacity. Alternatively, managers may be exercising greater flexibility in an attempt to overcome some (real or perceived) deficiency in the reporting of write-offs under SFAS 121 by providing a signal that better reflects the underlying performance of the firm. Future analysis may be able to distinguish between these two competing interpretations. Overall, the evidence increases our understanding of the reporting of asset write-offs, and may provide insights to standard setters in their assessment of how best to calculate and report long-lived asset impairments.

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Table 1 – Sample Selection

	Firm-Years	% of available	Firms	% of available
Available observations with the necessary CRSP/ Compustat data over the period 1992-1998, excluding banking and financial institutions (SIC 6000)	22,739		5,474	
Observations randomly selected	5,180	23%	1,249	23%
Observations deleted (10-K/annual report not available on Disclosure; observation is a bankrupt, full-cost, or start-up firm; or observation falls within 2-year transition period) [a]	(2,219)		(214)	
Write-off observations excluded [b]	(207)		0	
Final sample	2,754		1,035	
Amount Analysis - Non-write-off observations	2,299		919	
Amount Analysis - Write-off observations [c]	455		397	
Timeliness Analysis - Write-off observations [c]	486		422	

[a] The transition period is defined as the year of and immediately preceding the firm's adoption of SFAS 121.

[b] The analyses use only one randomly selected write-off observation per firm per regime to reduce potential auto-correlation between my write-off observations.

[c] The number of write-off observations is unequal for the amount and timeliness analyses due to differing data requirements.

Table 2 – Industry Composition

This table presents the industry composition (defined by 2-digit SIC code) for the population and sample observations, indicating the ten industries having the highest representation within each grouping.

Industry [a]	SIC	Available (N = 22,739) (1)	Amount Analysis (N = 2,754) (2)	Amount Non-write-off (N = 2,299) (3)	Amount Write-off (N = 455) (4)	Pre [b] Write-off (N = 190) (5)	Post [b] Write-off (N = 265) (6)
Oil and Gas Extraction	13	3.1 %	1.7 %	1.7 %	2.0 %	3.7	0.8
Food and Kindred Products	20	2.7	3.0	3.0	3.1	2.6	3.4
Chemicals and Allied Products	28	8.2	6.3	6.0	8.1	7.4	8.7
Industrial Machinery / Equip	35	7.3	7.5	7.6	7.0	7.4	6.8
Electronic Equipment	36	8.6	10.5	10.2	11.4	11.6	11.3
Transportation Equipment	37	2.5	2.9	2.9	2.6	2.1	3.0
Instruments / Related Products	38	7.2	6.5	6.4	7.0	7.4	6.8
Communications	48	2.6	2.3	2.7	0.7	1.1	0.4
Electric, Gas, Sanitary Services	49	6.0	5.2	5.1	5.5	6.3	4.9
Whole Trade – Durable Goods	50	3.2	3.2	3.4	2.9	3.2	2.6
Eating and Drinking Places	58	1.8	1.8	1.2	3.3	3.7	3.0
Business Services	73	8.9	10.8	10.8	10.8	8.9	12.1
Health Services	80	1.9	2.0	1.8	2.9	3.7	2.3
All Other Industries		35.9	36.4	37.2	32.7	30.9	33.9
TOTAL		100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %

[a] The industry breakdown for the 486 write-off observations used in the timeliness analysis is very similar to the 455 for the amount analysis in column 4, and thus is not presented.

[b] Pre (Post) refers to write-off observations falling within the pre-SFAS 121 (post-SFAS 121) regime.

Table 3 –Determinants of Long-Lived Asset Write-offs: Descriptive Statistics

This table provides descriptive statistics for the variables used in the analysis examining the determinants of write-off amounts across the pre-SFAS 121 and post-SFAS 121 regimes. Panel A reflects the write-offs and Panel B the non-write-off observations, with the data in both panels grouped by regime. Panel C reflects the write-off and non-write-off observations, pooled across the regimes.

Panel A: Descriptive statistics for pre- and post-SFAS 121 write-off observations (N = 455)

Variable [a]	Pre-SFAS 121 (N = 190) [b]			Post-SFAS 121 (N = 265) [b]		
	Mean	**Median**	**SD**	**Mean**	**Median**	**SD**
$WOTA_{it}$	0.0285	0.0188	0.0276	0.0281	0.0126	0.0379
ΔGDP_t	0.0545	0.0512	0.0044	0.0589	0.0557	0.0044
$\Delta INDROA_{it}$	-0.0002	0.0001	0.0077	-0.0058	-0.0043	0.0094
$\Delta SALES_{it}$	0.0402	0.0190	0.2583	0.1284	0.0404	0.5513
E_{it}	-0.0240	0.0092	0.1106	-0.0180	0.0190	0.1605
ΔOCF_{it}	-0.0098	-0.0104	0.0905	-0.0072	-0.0048	0.1068
ΔMGT_{it}	0.2000	0.0000	0.4011	0.3509	0.0000	0.4782
$\Delta ENEG_{it}$	-0.0527	-0.0153	0.0945	-0.0596	-0.0139	0.1016
$\Delta EPOS_{it}$	0.0188	0.0000	0.0551	0.0230	0.0000	0.0676
$DEBT_{it}$	0.5789	1.0000	0.4950	0.6566	1.0000	0.4757
WOE_{it}	3.6916	0.3568	34.4201	2.0335	0.2275	8.9037
WO_{it}	44.2082	6.0944	139.9897	33.6583	3.5750	102.6684

Panel B: Descriptive statistics for pre- and post-SFAS 121 non-write-off observations (N = 2,299)

Variable [a]	Pre-SFAS 121 (N = 1,258) [b]			Post-SFAS 121 (N = 1,041) [b]		
	Mean	**Median**	**SD**	**Mean**	**Median**	**SD**
ΔGDP_t	0.0559	0.0556	0.0051	0.0597	0.0558	0.0045
$\Delta INDROA_{it}$	0.0025	0.0013	0.0074	-0.0032	-0.0021	0.0089
$\Delta SALES_{it}$	0.1813	0.1074	0.4519	0.2262	0.1101	0.5500
E_{it}	0.0522	0.0501	0.1268	0.0409	0.0601	0.1627
ΔOCF_{it}	0.0142	0.0128	0.1046	0.0149	0.0156	0.1341
ΔMGT_{it}	0.1669	0.0000	0.3731	0.2507	0.0000	0.4336
$\Delta ENEG_{it}$	-0.0193	0.0000	0.0684	-0.0232	0.0000	0.0616
$\Delta EPOS_{it}$	0.0385	0.0142	0.0691	0.0399	0.0138	0.0796
$DEBT_{it}$	0.7583	1.0000	0.4283	0.7262	1.0000	0.4461

Panel C: Descriptive statistics for write-off/non-write-off observations (N = 2,754)

Variable [a]	Write-off Observations (*N* = 455)			Non-write-off Observations (*N* = 2,299)		
	Mean	**Median**	**SD**	**Mean**	**Median**	**SD**
$WOTA_{it}$	0.0283	0.0145	0.0340	0.0000	0.0000	0.0000
ΔGDP_t	0.0571	0.0557	0.0049	0.0576	0.0557	0.0052
$\Delta INDROA_{it}$	-0.0034	-0.0014	0.0092	-0.0001	0.0002	0.0086
$\Delta SALES_{it}$	0.0916	0.0303	0.4544	0.2016	0.1080	0.4991
E_{it}	-0.0205	0.0151	0.1417	0.0471	0.0538	0.1442
ΔOCF_{it}	-0.0083	-0.0082	0.1003	0.0145	0.0140	0.1188
ΔMGT_{it}	0.2879	0.0000	0.4533	0.2049	0.0000	0.4037
$\Delta ENEG_{it}$	-0.0567	-0.0151	0.0986	-0.0211	0.0000	0.0654
$\Delta EPOS_{it}$	0.0212	0.0000	0.0627	0.0391	0.0141	0.0740
$DEBT_{it}$	0.6242	1.0000	0.4849	0.7438	1.0000	0.4366

[a] Variable definitions:

$WOTA_{it}$: the net of tax long-lived asset write-off (reflected as a *positive* amount) reported by firm *i* for period *t*, divided by firm *i*'s total assets at the end of period *t-1*.

ΔGDP_t : the percent change in US Gross Domestic Product from period *t-1* to *t*.

$\Delta INDROA_{it}$: the median change in firm *i*'s industry return on assets from period *t-1* to *t*, where industry is defined at the 2-digit SIC level.

$\Delta SALES_{it}$: the percent change in sales for firm *i* from period *t-1* to *t*.

E_{it} : firm *i*'s pre-write-off earnings for period *t*, divided by total assets at the end of period *t-1*.

ΔOCF_{it} : firm *i*'s change in operating cash flows from period *t-1* to *t*, divided by total assets at the end of period *t-1*.

ΔMGT_{it} : an indicator variable equal to 1 if firm *i* experiences a change in senior management (defined as the top three compensated positions within the firm) from year *t-1* to *t*, 0 otherwise.

$\Delta ENEG_{it}$ ($\Delta EPOS_{it}$): the change in firm *i*'s pre-write-off earnings from period *t-1* to *t*, divided by total assets at the end of period *t-1*, if this change is negative (positive); 0 otherwise.

$DEBT_{it}$: a dummy variable equal to 1 if firm *i*'s debt in period *t* is private (i.e., not publicly rated by Standard and Poor's), 0 otherwise.

WOE_{it} : the net of tax write-off recorded by firm *i* for period *t*, divided by the absolute value of firm *i*'s pre-write-off earnings for the same period *t*.

WO_{it} : the net of tax write-off (in millions of dollars) recorded by firm *i* for period *t*.

[b] Pre (Post) refers to observations occurring within the pre-SFAS 121 (post-SFAS 121) regime.

Table 4 –Determinants of Long-Lived Asset Write-offs: Pearson Correlations

This table provides Pearson correlations for the variables used in the analysis examining the determinants of write-off amounts across the pre-SFAS 121 and post-SFAS 121 regimes. Panel A provides correlations for the pre-SFAS 121 observations, Panel B for the post-SFAS 121 observations, and Panel C for the pooled observations.

Panel A: Pearson correlations for the pre-SFAS 121 observations (N = 1,448)

Variable [a]	$WOTA_{it}$	ΔGDP_t	$\Delta INDROA_{it}$	$\Delta SALES_{it}$	E_{it}	ΔOCF_{it}	ΔMGT_{it}	$\Delta ENEG_{it}$	$\Delta EPOS_{it}$
ΔGDP_t	-0.114 ***								
$\Delta INDROA_{it}$	-0.091 ***	0.210 ***							
$\Delta SALES_{it}$	-0.081 ***	0.028	0.005						
E_{it}	-0.204 ***	0.029	0.052 **	0.053 **					
ΔOCF_{it}	-0.079 ***	0.002	0.022	0.064 **	0.235 ***				
ΔMGT_{it}	-0.006	0.026	0.021	0.017	0.102 ***	0.026			
$\Delta ENEG_{it}$	-0.204 ***	0.052 **	0.060 **	0.097 ***	0.499 ***	0.172 ***	0.050 *		
$\Delta EPOS_{it}$	-0.049 *	0.003	0.083 ***	0.229 ***	0.235 ***	0.305 ***	0.027	0.124 ***	
$DEBT_{it}$	0.001	0.014	0.030	0.091 ***	0.006	0.006	-0.155 ***	-0.102 ***	0.142 ***

Panel B: Pearson correlations for the post-SFAS 121 observations (N = 1,306)

Variable [a]	$WOTA_{it}$	ΔGDP_t	$\Delta INDROA_{it}$	$\Delta SALES_{it}$	E_{it}	ΔOCF_{it}	ΔMGT_{it}	$\Delta ENEG_{it}$	$\Delta EPOS_{it}$
ΔGDP_t	0.010								
$\Delta INDROA_{it}$	0.004	0.307 ***							
$\Delta SALES_{it}$	-0.016	0.001	0.032						
E_{it}	-0.204 ***	0.031	0.022	0.029					
ΔOCF_{it}	-0.071 **	-0.028	0.049 *	0.116 ***	0.186 ***				
ΔMGT_{it}	-0.021	-0.005	0.003	-0.007	0.141 ***	0.054 *			
$\Delta ENEG_{it}$	-0.305 ***	0.038	0.120 ***	0.057 **	0.606 ***	0.241 ***	0.080 ***		
$\Delta EPOS_{it}$	-0.053 *	0.028	0.075 ***	0.218 ***	0.106 ***	0.223 ***	-0.057 **	0.197 ***	
$DEBT_{it}$	0.014	0.008	-0.053 *	0.039	-0.067 **	-0.020	-0.354 ***	-0.137 ***	0.136 ***

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Panel C: Pearson correlations for the pooled observations (N = 2,754)

Variable [a]	$WOTA_{it}$	ΔGDP_t	$\Delta INDROA_{it}$	$\Delta SALES_{it}$	E_{it}	ΔOCF_{it}	ΔMGT_{it}	$\Delta ENEG_{it}$	$\Delta EPOS_{it}$
ΔGDP_t	-0.021								
$\Delta INDROA_{it}$	-0.049 ***	0.101 ***							
$\Delta SALES_{it}$	-0.038 **	0.029	0.005						
E_{it}	-0.205 ***	0.011	0.048 **	0.036 *					
ΔOCF_{it}	-0.074 ***	-0.013	0.036 *	0.094 ***	0.206 ***				
ΔMGT_{it}	-0.008	0.054 ***	-0.030	0.008	0.118 ***	0.041 **			
$\Delta ENEG_{it}$	-0.259 ***	0.025	0.101 ***	0.072 ***	0.553 ***	0.207 ***	0.059 ***		
$\Delta EPOS_{it}$	-0.051 ***	0.015	0.073 ***	0.223 ***	0.160 ***	0.258 ***	-0.018	0.160 ***	
$DEBT_{it}$	0.007	0.001	-0.005	0.061 ***	-0.032 *	-0.008	-0.259 ***	-0.117 ***	0.139 ***

[a] Variable definitions:

$WOTA_{it}$: the net of tax long-lived asset write-off (reflected as a *positive* amount) reported by firm i for period t, divided by firm i's total assets at the end of period $t-1$.

ΔGDP_t : the percent change in US Gross Domestic Product from period $t-1$ to t.

$\Delta INDROA_{it}$: the median change in firm i's industry return on assets from period $t-1$ to t, where industry is defined at the 2-digit SIC level.

$\Delta SALES_{it}$: the percent change in sales for firm i from period $t-1$ to t.

E_{it} : firm i' s pre-write-off earnings for period t, divided by total assets at the end of period $t-1$.

ΔOCF_{it} : firm i's change in operating cash flows from period $t-1$ to t, divided by total assets at the end of period $t-1$.

ΔMGT_{it} : an indicator variable equal to 1 if firm i experiences a change in senior management (defined as the top three compensated positions within the firm) from year $t-1$ to t, 0 otherwise.

$\Delta ENEG_{it}$ ($\Delta EPOS_{it}$): the change in firm i's pre-write-off earnings from period $t-1$ to t, divided by total assets at the end of period $t-1$, if this change is negative (positive); 0 otherwise.

$DEBT_{it}$: a dummy variable equal to 1 if firm i's debt in period t is private (i.e., not publicly rated by Standard and Poor's), 0 otherwise.

[b] Pre (Post) refers to observations occurring within the pre-SFAS 121 (post-SFAS 121) regime.

*** ** * Significant at < .01, < .05 and < .10 levels for two-tailed tests.

Table 5 – Determinants of Long-Lived Asset Write-offs: Regression Results

This table presents the results of the regression analyses examining the determinants of long-lived asset write-off amounts across the pre-SFAS 121 and post-SFAS 121 regimes. Panel A presents the results using a tobit specification; Panel B presents the results using OLS. For both specifications, parameter estimates are based on the following model:

$$
\begin{aligned}
WOTA_{it} = Pre * &\left[\begin{array}{l} \phi_0 + \phi_1 \Delta GDP_t + \phi_2 \Delta INDROA_{it} + \phi_3 \Delta SALES_{it} + \phi_4 E_{it} + \phi_5 \Delta OCF_{it} \\ \phi_6 \Delta MGT_{it} + \phi_7 \Delta ENEG_{it} + \phi_8 \Delta EPOS_{it} + \phi_9 DEBT_{it} \end{array} \right] \\
+ Post * &\left[\begin{array}{l} \rho_0 + \rho_1 \Delta GDP_t + \rho_2 \Delta INDROA_{it} + \rho_3 \Delta SALES_{it} + \rho_4 E_{it} + \rho_5 \Delta OCF_{it} \\ \rho_6 \Delta MGT_{it} + \rho_7 \Delta ENEG_{it} + \rho_8 \Delta EPOS_{it} + \rho_9 DEBT_{it} \end{array} \right] + \zeta_{it}
\end{aligned}
\tag{1}
$$

This model reflects the stacking of two regressions: firm-year observations from the pre-SFAS 121 regime, and firm-year observations from the post-SFAS 121 regime. Thus, *Pre* (*Post*) is a dummy variable equal to one for observations from the pre-SFAS 121 (post-SFAS 121) regime, 0 otherwise. The total sample consists of 2,754 firm-year observations, comprised of 1,448 occurring within the pre-SFAS 121 regime (190 write-off and 1,258 non-write-off), and 1,306 within the post-SFAS 121 regime (265 write-off and 1,041 non-write-off).

Panel A: Tobit analysis examining the determinants of write-off amounts

Variable [a]	Predicted	Pre (*N*=1,448) [b] Coefficient [c] (*Z*-statistic)	Post (N=1,306) [b] Coefficient [c] (*Z*-statistic)	Hypoth	TESTS OF HYPOTHESES Difference Predicted	Difference (*Z*-statistic)
Intercept	?	0.434 (1.545)	- 0.323 (- 1.053)			
ΔGDP_t	-	- 16.073 *** (- 3.171)	- 3.078 (- 0.606)	H_1	+/-	- 12.995 * (- 1.814)
$\Delta INDROA_{it}$	-	- 9.994 *** (- 3.156)	- 3.154 (- 1.263)	H_1	+/-	- 6.840 * (- 1.703)
$\Delta SALES_{it}$	-	- 0.250 *** (- 2.935)	- 0.048 (- 1.159)	H_1	+/-	- 0.202 ** (- 2.143)
E_{it}	-	- 1.136 *** (- 5.017)	- 0.305 ** (- 1.957)	H_1	+/-	- 0.831 *** (- 3.038)
ΔOCF_{it}	-	- 0.001 (- 0.490)	- 0.001 (- 0.265)	H_1	+/-	0.000 (0.181)
ΔMGT_{it}	+	0.039 (0.631)	0.095 * (1.865)	H_2	+/-	- 0.056 (- 0.688)
$\Delta ENEG_{it}$	-	- 0.428 (- 1.268)	- 1.840 *** (- 5.627)	H_2	+/-	1.412 *** (3.010)
$\Delta EPOS_{it}$	+	- 0.360 (- 0.840)	- 0.225 (- 0.698)	H_2	+/-	- 0.134 (- 0.251)
$DEBT_{it}$	-	- 0.170 *** (- 3.232)	- 0.086 * (- 1.702)	H_2	+/-	- 0.084 (- 1.144)
Model Adjusted-R^2				0.085		
Model *F*-test				14.480		

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Panel B: OLS analysis examining the determinants of write-off amounts

Variable [a]	Predicted	Pre (N=1,448) [b] Coefficient [c] (t-statistic)	Post (N=1,306) [b] Coefficient [c] (t-statistic)	Hypoth	Difference Predicted	Difference (t-statistic)
Intercept	?	0.182 *** (3.591)	0.016 (0.241)			
ΔGDP_t	-	- 2.491 *** (- 2.783)	0.490 (0.453)	H_1	+/-	- 2.981 ** (- 2.103)
$\Delta INDROA_{it}$	-	- 1.117 ** (- 1.850)	0.887 (1.613)	H_1	+/-	- 2.004 *** (- 2.452)
$\Delta SALES_{it}$	-	- 0.020 ** (- 1.954)	- 0.001 (- 0.012)	H_1	+/-	- 0.019 (- 1.505)
E_{it}	-	- 0.148 *** (- 3.612)	- 0.029 (- 0.814)	H_1	+/-	- 0.119 ** (- 2.188)
ΔOCF_{it}	-	- 0.040 (- 0.881)	0.006 (0.151)	H_1	+/-	- 0.046 (- 0.778)
ΔMGT_{it}	+	0.007 (0.573)	- 0.001 (- 0.082)	H_2	+/-	0.008 (0.470)
$\Delta ENEG_{it}$	-	- 0.230 *** (- 3.290)	- 0.863 *** (- 10.340)	H_2	+/-	0.633 *** (5.804)
$\Delta EPOS_{it}$	+	0.055 (0.771)	0.022 (0.351)	H_2	+/-	0.033 (0.341)
$DEBT_{it}$	-	- 0.002 (- 0.154)	- 0.016 (- 1.420)	H_2	+/-	0.014 (0.942)

Model Adjusted-R^2 0.148
Model *F*-test   24.570

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[a] Variable definitions:

$WOTA_{it}$: the net of tax long-lived asset write-off (reflected as a *positive* amount) reported by firm *i* for period *t*, divided by firm *i*'s total assets at the end of period *t-1*.

ΔGDP_t : the percent change in US Gross Domestic Product from period *t-1* to *t*.

$\Delta INDROA_{it}$: the median change in firm *i*'s industry return on assets from period *t-1* to *t*, where industry is defined at the 2-digit SIC level.

$\Delta SALES_{it}$: the percent change in sales for firm *i* from period *t-1* to *t*.

E_{it} : firm *i*'s pre-write-off earnings for period *t*, divided by total assets at the end of period *t-1*.

ΔOCF_{it} : firm *i*'s change in operating cash flows from period *t-1* to *t*, divided by total assets at the end of period *t-1*.

ΔMGT_{it} : an indicator variable equal to 1 if firm *i* experiences a change in senior management (defined as the top three compensated positions within the firm) from year *t-1* to *t*, 0 otherwise.

$\Delta ENEG_{it}$ ($\Delta EPOS_{it}$): the change in firm *i*'s pre-write-off earnings from period *t-1* to *t*, divided by total assets at the end of period *t-1*, if this change is negative (positive); 0 otherwise.

$DEBT_{it}$: a dummy variable equal to 1 if firm *i*'s debt in period *t* is private (i.e., not publicly rated by Standard and Poor's), 0 otherwise.

[b] Pre (Post) refers to observations occurring within the pre-SFAS 121 (post-SFAS 121) regime.

[c] All coefficients have been multiplied by 10 for presentation purposes.

*** ** * Significant at < .01, < .05 and < .10 levels for the indicated one or two-tailed test.

Table 6 – Determinants of Long-Lived Asset Write-offs: Alternative Interpretations of TOBIT Coefficients

This table presents the coefficients and their differences across the pre-SFAS 121 and post-SFAS 121 regimes, specified under alternative derivations of the tobit parameters obtained from Eq. (1). Tobit allows for three possible interpretations from the obtained coefficient estimates (see McDonald and Moffitt [1980], Maddala [1983], and Roncek [1992]). First, the untransformed coefficients (columns 1-3) provide inferences with respect to the latent variable (i.e., changes in asset values). Second, with some algebra applied to the untransformed parameters, one may ascertain the slope effects for those observations above the limit (i.e., the write-off observations), as presented in columns 4-6. Similarly, one may examine the effect of the independent variables on the change in the probability of reporting a write-off when none has been reported (i.e., the non-write-off observations), as presented in columns 7-9.

The inferences below appear consistent with those presented in Table 5. For the economic factors, where the predicted sign is negative within each regime, the pre-SFAS 121 observations have consistently more negative associations. Similarly, the post-SFAS 121 observations have consistently more negative associations for the "big bath" reporting incentive.

Variable [d]	Untransformed [a] (i.e., latent variable)			Change in Y if Above Limit [b] (i.e. write-off observations)			Change in Probability of Being Above Limit [c] (i.e., non-write-off observations)		
	Pre [e] (N = 1,448) (1)	Post [e] (N = 1,306) (2)	Diff (3)	Pre [e] (N = 190) (4)	Post [e] (N = 265) (5)	Diff (6)	Pre [e] (N = 1,258) (7)	Post [e] (N = 1,041) (8)	Diff (9)
ΔGDP_t	-1.6073	-0.3078	-1.2995	-0.2916	-0.0663	-0.2253	-20.6%	-5.2%	-15.4%
$\Delta INDROA_{it}$	-0.9994	-0.3154	-0.6840	-0.1813	-0.0679	-0.1134	-12.8%	-5.4%	-7.5%
$\Delta SALES_{it}$	-0.0250	-0.0048	-0.0202	-0.0045	-0.0010	-0.0035	-0.3%	-0.1%	-0.2%
E_{it}	-0.1136	-0.0305	-0.0831	-0.0206	-0.0066	-0.0140	-1.5%	-0.5%	-0.9%
ΔOCF_{it}	-0.0001	-0.0001	0.0000	0.0000	0.0000	0.0000	0.0%	0.0%	0.0%
ΔMGT_{it}	0.0039	0.0095	-0.0056	0.0007	0.0020	-0.0013	0.1%	0.2%	-0.1%
$\Delta ENEG_{it}$	-0.0428	-0.1840	0.1412	-0.0078	-0.0396	0.0318	-0.5%	-3.1%	2.6%
$\Delta EPOS_{it}$	-0.0360	-0.0225	-0.0135	-0.0065	-0.0048	-0.0017	-0.5%	-0.4%	-0.1%
$DEBT_{it}$	-0.0170	-0.0086	-0.0084	-0.0031	-0.0019	-0.0012	-0.2%	-0.1%	-0.1%

[a] The untransformed coefficients are those from Panel A of Table 5 (except the values presented above have not been multiplied by 10). These provide inferences with respect to the latent variable (i.e., the untruncated population or unobserved dependent variable, which is both increases and decreases in the value of the firm's assets).

[b] The slope effect of the independent variables on the dependent variable for those observations that are above the limit (i.e., write-off observations), calculated as $\frac{\partial E(y^*)}{\partial X_i} = B_i \left[1 - \left(z \frac{f(z)}{F(z)} \right) - \left(\frac{f(z)^2}{F(z)^2} \right) \right]$, where:

   y^* is the dependent variable for those observations above the limit;
   X_i is the independent variable i;
   B_i is the untransformed tobit coefficient estimate for variable i;
   $F(z)$ is the cumulative normal distribution function associated with the proportion of observations above the limit (13.1% for the pre-SFAS 121 and 20.3 % for the post-SFAS 121 observations);
   z is the z-score for the area relating to $F(z)$ under the normal curve; and
   $f(z)$ is the ordinate normal density at z.

[c] The effect of the independent variables on the change in the probability of being above the limit (i.e., reporting a non-0 write-off) for those observations reporting no write-offs, calculated as $\frac{\partial F(z)}{\partial X_i} = B_i \frac{f(z)}{sigma}$, where:

   $sigma$ is the standard deviation of the error term; and
   all other components are as defined in footnote b above.

[d] Variable definitions:

ΔGDP_t : the percent change in US Gross Domestic Product from period t-1 to t.
$\Delta INDROA_{it}$: the median change in firm i's industry return on assets from period t-1 to t, where industry is defined at the 2-digit SIC level.
$\Delta SALES_{it}$: the percent change in sales for firm i from period t-1 to t.
E_{it} : firm i' s pre-write-off earnings for period t, divided by total assets at the end of period t-1.
ΔOCF_{it} : firm i's change in operating cash flows from period t-1 to t, divided by total assets at the end of period t-1.
ΔMGT_{it} : an indicator variable equal to 1 if firm i experiences a change in senior management (defined as the top three compensated positions within the firm) from year t-1 to t, 0 otherwise.
$\Delta ENEG_{it}$ ($\Delta EPOS_{it}$): the change in firm i's pre-write-off earnings from period t-1 to t, divided by total assets at the end of period t-1, if this change is negative (positive); 0 otherwise.
$DEBT_{it}$: a dummy variable equal to 1 if firm i's debt in period t is private (i.e., not publicly rated by Standard and Poor's), 0 otherwise.

[e] Pre (Post) refers to observations occurring within the pre-SFAS 121 (post-SFAS 121) regime.

Table 7 – Timeliness of Long-Lived Asset Write-offs: Descriptive Statistics

This table provides descriptive statistics for the variables used in the analysis examining the timeliness of long-lived asset write-offs across the pre-SFAS 121 and post-SFAS 121 regimes. Panel A provides statistics for write-off observations across the two regimes; Panel B provides the Pearson correlations for the variables. The total number of firm-years equals 486, with $N = 203$ for the pre-SFAS 121 regime and $N = 283$ for the post-SFAS 121 regime.

Panel A: Descriptive statistics for write-off observations by pre-SFAS 121 and post-SFAS 121 regime

Variable [a]	Pre-SFAS 121 ($N = 203$) [b]			Post-SFAS 121 ($N = 283$) [b]		
	Mean	Median	Standard Deviation	Mean	Median	Standard Deviation
ΔMV_{it}	0.0830	-0.0188	0.5444	-0.0618	-0.1196	0.8014
ΔMV_{it-1}	-0.0101	-0.0346	0.3424	0.1826	0.1103	0.5857
E^*_{it}	-0.0572	-0.0016	0.1689	-0.0166	0.0202	0.1643
WO_{it}	-0.0529	-0.0294	0.0657	-0.0365	-0.0160	0.0533
E^*_{it+1}	0.0286	0.0442	0.1495	0.0084	0.0388	0.1867
WO_{it+1}	-0.0051	0.0000	0.0180	-0.0042	0.0000	0.0125
E^*_{it-1}	-0.0064	0.0346	0.1333	0.0160	0.0477	0.1423
WO_{it-1}	-0.0024	0.0000	0.0176	-0.0120	0.0000	0.0614

Panel B: Pearson correlations of variables used in timeliness analysis (N = 486)

Variable [a]	ΔMV_{it-1}	E^*_{it}	WO_{it}	E^*_{it+1}	WO_{it+1}	E^*_{it-1}	WO_{it-1}
ΔMV_{it}	-0.151 ***	0.170 ***	0.041	0.262 ***	0.055	-0.032	-0.003
ΔMV_{it-1}		0.193 ***	-0.006	0.118 ***	0.034	0.205 ***	0.059
E^*_{it}			0.401 ***	0.449 ***	0.026	0.436 ***	0.135 **
WO_{it}				0.067	0.152 ***	0.208 ***	0.250 ***
E^*_{it+1}					0.054	0.215 ***	-0.012
WO_{it+1}						-0.039	-0.020
E^*_{it-1}							0.186 ***

[a] Variable definitions:

ΔMV_{it} (ΔMV_{it-1}): the contemporaneous (lagged) market response for firm i for period t ($t-1$), measured as the twelve-month change in market value ending three months following the firm's fiscal year-end. Both measures are adjusted for dividends and capital contributions, and scaled by market value at the end of period $t-2$.

E^*_{it} (E^*_{it+1}) [E^*_{it-1}]: earnings, before extraordinary items and the net of tax write-off amount, of firm i for period t ($t+1$) [$t-1$], scaled by firm i's market value at the end of period $t-2$.

WO_{it} (WO_{it+1}) [WO_{it-1}]: the net of tax write-off reported by firm i for period t ($t+1$) [$t-1$], scaled by firm i's market value at the end of period $t-2$.

[b] Pre (Post) refers to observations occurring within the pre-SFAS 121 (post-SFAS 121) regime.

*** ** * Significant at < .01, < .05 and < .10 levels for two-tailed tests.

Table 8 – Timeliness of Long-Lived Asset Write-offs: Regression Results

This table provides the results contrasting the timeliness of long-lived asset write-offs across the pre-SFAS 121 and post-SFAS 121 regimes. Panel A presents the parameter estimates, and Panel B presents the results of the Wald test examining the non-linear parameter restriction. All analyses are based on the stacked regression comprised of the following equations: [a, b]

$$\Delta MV_{it} = Pre * \left[\beta_0^t + \beta_1^t E *_{it} + \boldsymbol{\beta_2^t WO_{it}} + \beta_3^t E *_{i,t+1} + \beta_4^t WO_{i,t+1} \right]$$
$$+ Post * \left[\lambda_0^t + \lambda_1^t E *_{it} + \boldsymbol{\lambda_2^t WO_{it}} + \lambda_3^t E *_{i,t+1} + \lambda_4^t WO_{i,t+1} \right] + \varepsilon_{it} \qquad (5)$$

$$\Delta MV_{i,t-1} = Pre * \left[\beta_0^{t-1} + \beta_1^{t-1} E *_{i,t-1} + \beta_2^{t-1} WO_{i,t-1} + \beta_3^{t-1} E *_{it} + \boldsymbol{\beta_4^{t-1} WO_{it}} \right]$$
$$+ Post * \left[\lambda_0^{t-1} + \lambda_1^{t-1} E *_{i,t-1} + \lambda_2^{t-1} WO_{i,t-1} + \lambda_3^{t-1} E *_{it} + \boldsymbol{\lambda_4^{t-1} WO_{it}} \right] + \varepsilon_{i,t-1} \qquad (5a)$$

Panel A: Regression results

			ΔMV_it			*ΔMV_it-1*	
		Pred.	**Parameter**	**Coefficient (*t*-statistic)**	**Pred.**	**Parameter**	**Coefficient (*t*-statistic)**
PRE [c] (N = 203)	Intercept	?	β_0^t	0.071 (1.289)	?	β_0^{t-1}	- 0.025 (- 0.457)
	$E*_{it-1}$				+	β_1^{t-1}	0.427 (1.211)
	WO_{it-1}				+	β_2^{t-1}	- 0.280 (- 0.110)
	$E*_{it}$	+	β_1^t	0.202 (0.654)	+	β_3^{t-1}	0.422 * (1.353)
	$\boldsymbol{WO_{it}}$	+	β_2^t	**- 0.066 (- 0.089)**	+	β_4^{t-1}	**0.771 (1.047)**
	$E*_{it+1}$	+	β_3^t	0.884 *** (2.843)			
	WO_{it+1}	+	β_4^t	0.923 (0.390)			
POST [c] (N = 283)	Intercept	?	λ_0^t	- 0.039 (- 0.888)	?	λ_0^{t-1}	0.135 *** (3.085)
	$E*_{it-1}$				+	λ_1^{t-1}	0.559 ** (2.011)
	WO_{it-1}				+	λ_2^{t-1}	0.771 (1.254)
	$E*_{it}$	+	λ_1^t	0.490 ** (1.870)	+	λ_3^{t-1}	0.520 ** (2.132)
	$\boldsymbol{WO_{it}}$	+	λ_2^t	**0.145 (0.206)**	+	λ_4^{t-1}	**1.557 *** (2.134)**
	$E*_{it+1}$	+	λ_3^t	0.863 *** (3.947)			
	WO_{it+1}	+	λ_4^t	3.994 * (1.407)			

Model Adjusted-R^2			0.079
Model F-test			5.430

Panel B: Wald test of non-linear parameter restriction

	Estimate	**Standard Error**	**Probability**
$\dfrac{\beta_2^t}{\beta_2^t + \beta_4^{t-1}} - \dfrac{\lambda_2^t}{\lambda_2^t + \lambda_4^{t-1}} \neq 0$	-0.179	0.988	0.85

[a] Eqs. (5) and (5a) are run as a single stacked regression. Thus, the combined Eqs. (5) and (5a) represent the stacking of the following four regressions:
- contemporaneous market response (ΔMV_{it}) on contemporaneous write-offs (WO_{it}) (plus other variables) for the *pre-SFAS 121 observations*;
- contemporaneous market response (ΔMV_{it}) on contemporaneous write-offs (WO_{it}) (plus other variables) for the *post-SFAS 121 observations*;
- lagged market response ($\Delta MV_{i,t-1}$) on contemporaneous write-offs (WO_{it}) (plus other variables) for the *pre-SFAS 121 observations*; and
- lagged market response ($\Delta MV_{i,t-1}$) on contemporaneous write-offs (WO_{it}) (plus other variables) for the *post-SFAS 121 observations*.

[b] Variable definitions:

ΔMV_{it} (ΔMV_{it-1}): the contemporaneous (lagged) market response for firm i for period t (t-1), measured as the twelve month change in market value ending three months following the firm's fiscal year-end. Both measures are adjusted for dividends and capital contributions, and scaled by market value at the end of period t-2.

E^*_{it} (E^*_{it+1}) [E^*_{it-1}]: earnings, before extraordinary items and the net of tax write-off amount, of firm i for period t (t+1) [t-1], scaled by firm i's market value at the end of period t-2.

WO_{it} (WO_{it+1}) [WO_{it-1}]: the net of tax write-off recorded by firm i for period t (t+1) [t-1], scaled by firm i's market value at the end of period t-2.

Pre (*Post*): a dummy variable equal to 1 for observations occurring within the pre-SFAS 121 (post-SFAS 121) regime, 0 otherwise.

[c] Pre (Post) refers to observations occurring within the pre-SFAS 121 (post-SFAS 121) regime.

*** ** * Significant at < .01, < .05 and < .10 levels.

Table 9 – Timeliness of Long-Lived Asset Write-offs: Sensitivity Analyses

This table provides sensitivity analyses examining associations between the market responses as the dependent variables (i.e., ΔMV_{it} and $\Delta MV_{i,t-1}$) and the pre-write-off earnings and write-off variables.[a]

	MV_{it}				$MV_{i,t-1}$			
	coefficient (*t*-statistic) (1)	coefficient (*t*-statistic) (2)	coefficient (*t*-statistic) (3)	coefficient (*t*-statistic) (4)	coefficient (*t*-statistic) (5)	coefficient (*t*-statistic) (6)	coefficient (*t*-statistic) (7)	coefficient (*t*-statistic) (8)
PRE-SFAS 121[b]								
$E_{i,t-1}$					0.605 *** (3.442)	0.450 *** (2.291)		
$WO_{i,t-1}$							0.004 (0.009)	0.201 (0.142)
E_{it}	0.507 *** (2.262)	0.191 (0.801)				0.268 ** (1.734)		
WO_{it}			0.292 (0.501)	0.218 (0.372)				0.790 * (1.421)
$E_{i,t+1}$		0.898 *** (3.342)						
$WO_{i,t+1}$				1.575 (0.734)				
POST-SFAS 121[b]								
$E_{i,t-1}$					0.758 *** (3.162)	0.570 *** (2.173)		
$WO_{i,t-1}$							0.870 ** (1.541)	1.091 *** (1.843)
E_{it}	0.993 *** (3.503)	0.496 * (1.541)				0.392 ** (1.721)		
WO_{it}			1.079 (1.211)	0.970 (1.080)				0.807 (1.182)
$E_{i,t+1}$		0.871 *** (3.070)						
$WO_{i,t+1}$				3.811 (1.004)				

[a] Variable definitions:

    ΔMV_{it} (ΔMV_{it-1}): the contemporaneous (lagged) market response for firm i for period t ($t-1$), measured as the twelve month change in market value ending three months following the firm's fiscal year-end. Both measures are adjusted for dividends and capital contributions, and scaled by market value at the end of period $t-2$.

    E^{*}_{it} (E^{*}_{it+1}) [E^{*}_{it-1}]: earnings, before extraordinary items and the net of tax write-off amount, of firm i for period t ($t+1$) [$t-1$], scaled by firm i's market value at the end of period $t-2$.

    WO_{it} (WO_{it+1}) [WO_{it-1}]: the net of tax write-off recorded by firm i for period t ($t+1$) [$t-1$], scaled by firm i's market value at the end of period $t-2$.

[b] Pre (Post) refers to observations occurring within the pre-SFAS 121 (post-SFAS 121) regime.

*** ** * Significant at $< .01$, $< .05$ and $< .10$ levels.

VITA

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