Impairments of Investment Securities by Nonfinancial Firms*

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ABSTRACT

We study the characteristics of other-than-temporary impairments (OTTI) of investment securities in nonfinancial firms. Although nonfinancial firms hold substantial amounts of debt and equity securities, the respective accounting rules and related academic research focus predominantly on financial institutions. We first document the frequency and nature of OTTI among S&P 1,500 nonfinancial firms in the 2000-2013 period. Next, we explore the drivers of OTTI recognition in the sample. Consistent with the stated objective of FAS 115, we find that the propensity to report OTTI decreases in market-wide performance and firm-level proxies of intent and ability to hold the securities to recovery, and increases in the magnitude of the accumulated unrealized loss on investment securities. Importantly, we observe that earnings management proxies do not associate with OTTI in a pattern consistent with opportunistic reporting. Finally, we document a significant association between OTTI and earnings-announcement returns, supporting the notion that investors find the recognition of OTTI informative. Collectively, our findings raise questions on the optimality of ASU 2016-01, which eliminates OCI treatment of unrealized gains and losses for equity investments, for nonfinancial firms.

Keywords: Other-than-temporary impairment, OTTI, financial instruments, nonfinancial firms, FAS 115, ASC 320, ASU 2016-01

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1. Introduction

We examine the incidence and characteristics of other-than-temporary impairments (OTTI) of investment securities in nonfinancial firms. Contrary to their "labeling," nonfinancial firms often hold large portfolios of financial instruments. For example, in 2010, Dish Network held $2.3 billion of marketable investment securities, comprising 50 percent of its current assets. The same year Amazon held half a billion in corporate debt securities, and the Monarch Cement Company, a mid-size manufacturer with $174 million in total assets, held $24 million of equity securities. Despite this regularity, academic research and financial reporting guidance emphasize financial institutions, (implicitly) adopting the view that holding such assets is concentrated among them. We seek to gain insight into the accounting treatment of financial securities by nonfinancial firms, contributing to the debate on the enactment of ASU 2016-01. We believe the analysis stands to inform a broad audience and highlights the challenges arising from the gap between the "Wall Street" vs. "Main Street" approach to academic research and financial reporting regulation. The study also speaks to the rules-based vs. principles-based accounting regulation approach, the latter of which favors industry-agnostic standards.

OTTI stem from the interaction between the mixed attributes accounting model and conditional conservatism. Specifically, the former allows updating the balance sheet values of certain accounts to fair value each reporting period via other comprehensive income (OCI), sidestepping net income. These unrealized gains and losses aggregate in accumulated other comprehensive income (AOCI). Conditional conservatism, in turn, requires higher verification thresholds for the recognition of good news than bad news. This leads to a reclassification of accumulated unrealized losses from AOCI to retained earnings via an impairment charge when the decline in the value of a security below its amortized cost is deemed to be other-than-temporary.

In other words, when accumulated unrealized losses associated with investment securities not subject to full fair value accounting are considered other-than-temporary, they decrease net income for the respective reporting period.

After prolonged deliberations, in 2016 FASB enacted ASU 2016-01, which eliminates the available for sale (AFS) classification for all equity investment securities, effectively subjecting them to full fair value accounting. Although transacting in investment securities is endemic to financial institutions, as we note earlier, nonfinancial firms often have large holdings. Thus, the new rule impacts a number of nonfinancial firms directly. The pronouncement received staunch opposition, with comment letters highlighting the injection of volatility in net income and questioning the decision-usefulness of financial reports under the new guidance, particularly for nonfinancial firms. Specifically, opponents expressed concerns about the fundamental unsuitability of this accounting treatment for nonfinancial firms. Implicitly, they also suggested that nonfinancial firms do not misuse the flexibility embedded in OTTI reporting but recognize the charges in the spirit and letter of extant reporting rules. Contributing to the conversation, we seek to gain an understanding of the characteristics of OTTI among nonfinancial firms pre-ASU 2016-01.

Addressing the question requires data on OTTI in nonfinancial firms. We construct the respective dataset using a combination of algorithmic searches and hand collection. Focusing on S&P 1,500 nonfinancial firms from 2000 through 2013, we identify 352 firm-quarters with OTTI from 124 unique firms.[1] As descriptive evidence, we note that OTTI stem from both debt and

[1] As we discuss in Sec. 3.2, we do not consider technology and healthcare firms since their holdings of investment securities often underlie strategic initiatives or are driven by contractual agreements. We also exclude firms with financing arms, which effectively act as "shadow banks."

equity investments, manifest across industries, and occur in all fiscal quarters, although they are most frequent in the fourth fiscal quarter. Predictably, OTTI peak during the Financial Crisis.

Turning to regression analyses, we model the recognition of OTTI as a function of the probability a firm has investment securities likely to be impaired, its ability and intent to hold such securities, and opportunism. The first two sets of variables aim to identify settings where economic forces and accounting regulation drive the recognition of OTTI. The third addresses the presumption that firms may strategically use the flexibility embedded in the financial reporting rules. We find that the likelihood of reporting an OTTI increases in environmental factors, pointing to both a decrease in the value of the investment securities in a firm's portfolio and the probability the firm can and will hold onto them. Turning to strategic reporting, we consider four proxies of opportunism commonly used in the literature – big bath accounting, smoothing, the concurrent recognition of other income-decreasing special items, and narrowly beating the analysts' earnings consensus. At odds with the notion that nonfinancial firms might misapply the rules to gain private benefits, we fail to find evidence of opportunism in OTTI reporting within the sample.

As a direct investigation of the role of OTTI in the statement users' information sets, we also examine the market reaction to the reporting of OTTI in the pre-ASU 2016-01 period. Building on the rich literature on the informativeness of financial statements, we posit that if OTTI are deemed decision-useful, they should correlate with stock returns around the announcement date.[2] Controlling for the analysts' forecast error, we document that OTTI related to debt (equity) securities correlate negatively (positively) with the three-day abnormal returns around the earnings

[2] In principle, expenses should associate negatively with equity returns, as they reflect a decrease in economic value. Special items, such as OTTI, however, are often downplayed by statement users since they purport to represent a one-time adjustment. Moreover, evidence supports that special items may play a signaling role – e.g., restructuring charges reflect a commitment to turning around a struggling business – which would result in a stock price increase at their announcement. Thus, we focus on the statistical significance of the estimated coefficients on OTTI, leaving their magnitude and sign to future research.

announcement. This finding underscores the information value of the recognition of OTTI to the capital market participants.

As an exploratory analysis of the real effects of ASU 2016-01, we examine the change in the intensity and volatility of investment securities holdings (investment securities scaled by total assets) around the enactment of the regulation. Among the nonfinancial firms we examine, we observe that both decline from the pre- to the post-enactment period. Noting that market volatility increases during the period, we infer that nonfinancial firms restructure their portfolios, decreasing their holdings of investment securities. Although the analysis faces significant limitations due to data availability, the evidence points to a real effect in line with the concerns raised by opponents of the regulation during the deliberation period.

Finally, we recognize that OTTI are a function of a firm's choice to hold investment securities, i.e., self-selection is a potential threat to our inferences. To address the issue, we develop a selection model of investment securities holding among nonfinancial firms. We note that when we include the resultant Inverse Mill's Ratio as a control in the main model, the respective estimated coefficient is insignificant, and inferences are not affected.

With this study, we make two important contributions. First, to the best of our knowledge, we are the first to provide evidence on the incidence, characteristics, use, and information content of OTTI among nonfinancial firms. Accounting for financial assets held by nonfinancial firms is a uniquely clean setting to explore the determinants of impairment choices due to the low expected association between incentives reflecting underlying firm performance and the nature of asset value decline driven by investee characteristics. Second, we add to the literature examining rules vs. principles-based accounting standards (see Folsom, Hribar, Mergenthaler, and Peterson, 2017, for a review and operationalization of these concepts). Prior research provides some evidence that

omnibus, industry-agnostic accounting standards may have ramifications for large sectors of the economy. For example, Tillet (2022) finds that removing industry-specific revenue guidance in adopting ASC 606 decreases revenue comparability among firms that previously had such guidance relative to those that did not. We extend the discussion of the generalization of accounting standards by introducing the ASU 2016-01 setting. Although we do not intend to make normative statements with this study, we hope to spark an active discussion on the topic.

2. Background, literature review, and hypothesis development

The primary objective of this study is to shed light on the determinants for and characteristics of OTTI for nonfinancial companies. As such, we first provide a brief overview of the accounting for investment securities and OTTI under U.S. GAAP. We then discuss the relevant extant literature and motivate our research framework.

2.1 U.S. GAAP treatment of investment securities

The accounting treatment of debt and equity investment securities under U.S. GAAP generally follows ASC 320. The main principles underlying ASC 320, in turn, go back to FAS 115, which became effective for fiscal years beginning after December 15, 1993. Under FAS 115, public firms classify their investment securities into three categories based on the intended use and holding horizon. Specifically, securities bought and held with the intent to sell in the near term are classified as *trading*, debt securities acquired with the demonstrated intent and ability to be held to maturity are classified as *held-to-maturity* (HTM), and the securities that do not fit into either category are classified as *available-for-sale* (AFS). The accounting treatment among the three categories differs substantially. Specifically, whereas trading securities are reported at fair value with unrealized gains and losses included in earnings, the unrealized gains and losses of AFS and HTM generally do not impact current-period earnings. In the case of AFS, the securities are carried

at fair value on the balance sheet, and the unrealized gains and losses are reflected in AOCI. HTM, in turn, are reported at amortized historical cost, i.e., periodic fluctuations in market value do not impact the firm's financial statements.

FAS 115 also provides guidance on the treatment of unrealized losses deemed to be other-than-temporary. As noted above, earnings are shielded from periodic fluctuations in the market value for AFS and HTM, as the cumulative effect is recognized when the gain/loss is realized through a sale or maturity of the security. If the decline in the market value of a security below its amortized cost is judged to be other-than-temporary, however, the company is required to write down the security such that the current fair value becomes the new cost basis. The write-down, in turn, is included in current-period earnings. Importantly, the guidance allows a level of subjectivity in OTTI recognition as the choice and timing of the charge are supposed to reflect management's perception of whether the decline in value is temporary.[3] FSP FAS 115-2/124-2 (April 9, 2009) augments this treatment by requiring that only the credit component of the write-down be included in earnings as the non-credit component remains in AOCI.

In January 2016, FASB issued new accounting guidance for financial instruments, ASU 2016-01, effective starting the first quarter of 2018. The new guidance dramatically changes the accounting for equity holdings accounted for as investment securities. Specifically, equity investments now must be carried at fair value with period-to-period changes recognized in net income, effectively eliminating the available-for-sale classification for this class of financial instruments. Thus, all declines in the value of these investment assets, whether perceived to be

[3] EITF 99-20 provides a more stringent guideline for the recognition of OTTI for securities that fall within its scope (generally, credit-sensitive asset backed securities and prepayment-sensitive securities). Specifically, although FAS 115 allows a level of subjectivity requiring the company to determine whether the impairment is other-than-temporary, EITF 99-20 calls for using a trigger based on the information that a "market participant" would use. EITF 99-20-1 (Jan. 12, 2009) effectively eliminates this difference.

temporary or not, are immediately reflected in the income statement of the investing firm. The necessity to evaluate the declines in equity values for permanence and the valuation implications of such recognized impairments are eliminated. The impairment testing remains in effect for debt securities not classified as trading and for equity investments that do not have readily determinable fair values and are carried at cost.

The final rule was a culmination of several years of deliberations. FASB issued a first draft in 2010 and a second draft in 2013. The Board acknowledged that although "the issues that gave rise to the Board's consideration of the proposed guidance were raised in the context of financial institutions, [it] believes that the proposed guidance should not be limited to the accounting by those institutions" (2010 Draft, paragraph BC 17). This reflects the Board's preference for principles-based standard setting where an optimal accounting method for a given transaction can be applied across industries and firm types. Together, the two drafts received almost three thousand comment letters. Of the comment letters addressing the fair value reporting of equity securities previously classified as AFS, most responders highlight the introduced income statement volatility and the lack of decision-usefulness of such treatment, particularly for nonfinancial firms. The comment by SanDisk summarizes well the view shared by most nonfinancial commentators: "[t]he current practice of impairments for other-than-temporary changes in equity securities continues to be functioning as intended" (we provide additional examples in Appendix A).

The new rules received criticism from both sides of the fair value debate. The opponents contend that applying fair value to equity securities already introduces excessive volatility to the income statement. The (less vocal) proponents of fair value argue that debt securities, like equity securities, should be carried at fair value.[4] Importantly, however, both sides largely agree that the

[4] For example, although KPMG expressed the view that unrealized gains and losses on equity instruments should not be reflected in income, Deloitte expressed the view that changes in fair values equity investments should be recognized

new rules are written with a focus on financial institutions, as their applicability to nonfinancial firms is unclear.[5]

With this study, we inform the regulatory discourse by characterizing the dynamics of OTTI in nonfinancial firms and their informativeness to capital markets under the pre-intervention regime. Specifically, we offer evidence that would be useful to regulators in assessing the effectiveness of extant and future pronouncements affecting financial instruments, as well as statement preparers and users, who have to adapt to the effects of these regulations.

2.2 Literature review

Extant research on OTTI focuses on financial institutions. For example, Vyas (2011) compares the timeliness of credit instrument write-downs to devaluation schedules implied by credit indices. Using a sample of financial institutions with write-downs during the Financial Crisis, the author finds that firms delay recognizing impairments on credit instruments. Such delays are greater for more complex securities, consistent with the valuation uncertainty argument, and with less risky exposures, inconsistent with signaling. Badertscher, Burks, and Easton (2014) find that investors price OTTI of banks incrementally to the reported unrealized gains and losses, as only the credit portion of the impairment included in net income is priced for the bifurcated debt impairment components. The authors conclude that OTTI contain value-relevant information for investors. Khan, Ryan, and Varma (2019) document the importance of internal information flows

in net income. BDO went even further, supporting a similar treatment for debt: "[w]e would not split portions of the change in fair value between earnings and equity for certain debt instruments. We think this sets a bad precedent for future standard-setting when the Board may be tempted to avoid making difficult decisions on contentious issues."

[5] It is worth noting that a number of important changes have been also made to accounting for debt investments over this period. While ASU 2016-01 retained the OCI treatment of unrealized losses for available-for-sale and held-to-maturity debt securities, the credit losses standard FASB Topic 326 amended the guidance in 2020, retiring the terminology "other-than-temporary." It also applied the current expected credit loss (CECL) model for HTM debt securities and a modified impairment model for AFS debt securities. Effectively, for both types, firms are now required to use an allowance approach rather than writing down the cost basis of the securities, effectively allowing for impairment reversals. Similar to ASU 2016-01, these rules appear to be drafted with financial institutions in mind but apply to all holders of investments.

for OTTI recognition in the insurance industry. They show that firms required to carry securities at fair value record timelier impairments than those carrying them at amortized cost and attribute the difference to investments in information and internal control systems.

In terms of frequency, evidence suggests a dramatic increase in recognition of OTTI among financial institutions during the Financial Crisis. To underscore the point, Dong, Ryan, and Zhang (2014) observe only 11 OTTI among the largest 200 commercial banks during 1998-2006. Xie (2016) does not report frequencies but notes that "[…] seen as rare occurrences before the financial crisis, OTTIs on AFS and HTM securities for publicly traded banks amount to $14.0B and $23.3B during 2008 and 2009, respectively" (p. 267). The Financial Crisis also brought to the forefront the debate among academics, standards setters, and practitioners on the merits and flaws of fair value accounting relative to historical cost accounting. Opponents of fair value accounting argue that using market values to price assets amplifies the severity of financial downturns. This view is supported by theoretical models developed by Allen and Carletti (2008) and Plantin, Sapra, and Shin (2008) and empirical evidence as in Khan (2019). On the other side of the debate, proponents of mark-to-market accounting point out that although there were sharp price declines and asset fire-sales during the recent Financial Crisis, fair value accounting did not significantly contribute to the severity of the downturn (Laux and Leuz, 2010). Focusing on OTTI, Xie (2016) notes that when applied without bias, "[…] the amount of OTTI losses would have been the same under fair value accounting and historical cost accounting." Strategic considerations, however, may come into play. Countering the procyclicality argument, Cantrell and Yust (2019) argue that banks that sell more securities in a loss position cannot demonstrate the "intent and ability" to hold the assets in their portfolios, hence have to record more OTTI. Correspondingly, they find that banks sell fewer securities when they have larger unrealized losses, presumably to avoid recognizing

impairments. Notably, that stream of research focuses exclusively on financial institutions.

To sum up, extant research offers evidence that financial firms may exercise discretion in their accounting for investment securities. These findings, however, do not necessarily extend to nonfinancial firms. In particular, in contrast to financial firms, financial instruments are not the primary asset of nonfinancial firms. As such, the decision on the timing and magnitude of OTTI is less likely to be affected by strategic reporting incentives. The peripheral nature of the holdings, however, could also lower the incentive to invest in the information systems necessary to increase the accuracy of the impairment testing. Moreover, since the valuation of their financial assets is less likely to be correlated with the performance of these firms' primary lines of business, examining nonfinancial firms allows for a cleaner setting to study OTTI.

Turning to impairments of nonfinancial assets, prior research documents that although they are driven by micro- and macro-economic forces, managerial incentives also play a role (Elliott and Shaw, 1988; Zucca and Campbell, 1992; Francis, Hanna, and Vincent, 1996). Specifically, managers can strategically delay asset write-downs or accelerate recognition by engaging in big-bath accounting (Riedl, 2004), as evidence supports the existence of both. Alciatore, Easton, and Spear (2000) examine oil and gas accounting for exploration costs and find that discretion is applied to delay write-downs. Li, Shroff, Venkataraman, and Zhang (2011) suggest that managerial discretion is used to avoid recognizing goodwill impairments. Roychowdhury and Martin (2013) note that discretion in impairment accounting can be used to reveal private information or exploited to avoid recognition due to private incentives. They issue a call for "more research into the identification and relative prevalence of managerial opportunism in the timing and magnitude of accounting choices." Our study answers this call.

2.3 Research framework

To shed light on the accounting treatment of investment securities by nonfinancial firms we first explore the determinants of OTTI recognition. Consistent with regulatory guidance, we consider proxies reflective of "likelihood to have an impairment" and "intent *plus* ability to hold." Acknowledging the potential role of opportunism, we also consider a vector of variables capturing strategic reporting incentives.

A necessary condition for the reporting of OTTI is the holding of investment securities. Although investment securities are widespread among financial institutions, the business model of nonfinancial firms implies that, conceptually, these should be relatively rare in our sample. Thus, our first measure of the economically driven incidence of OTTI is the level of investment securities held by a firm. Specifically, we conjecture that the propensity to report OTTI increases in the holdings of investment securities. We also consider the measures capturing the health of the economy, the visibility of the firm, and the likelihood that the valuation of the firm's securities would be reassessed. We operationalize the constructs through the change in the S&P 500 index, the size of the company, and whether the observation is for the fourth fiscal quarter, respectively. Collectively, these variables aim to identify the extent to which economic forces that reflect the likelihood of having impaired investment securities shape the recognition of OTTI.

Next, we consider a vector of variables motivated by the guidance on recognizing OTTI. As highlighted by Badertscher, Burks, and Easton (2014), OTTI inform investors on the upper bound of the value of the investment securities. That is, OTTI should be recognized when the fair value of the securities declines below the amortized cost basis, and management believes this decline will not reverse during the period the company intends and is able to hold the securities. To capture this idea, we deploy three sets of variables targeting decline in value, intent to hold, and ability to hold the investment securities. We model a decline in value via the level and change

of a firm's unrealized losses position. As a proxy for intent to hold, we consider the historical trading intensity (purchases and sales of investment securities) of the firm. Finally, as proxies for "ability to hold," we consider the firm's free cash flow, working capital, and historical leverage, as we expect the likelihood of selling investment securities to increase with firm's liquidity needs.[6] If the recognition of OTTI reflects the spirit of the regulatory guidance, we expect the propensity of reporting to increase in the unrealized losses, trading intensity, and liquidity needs of the firm.[7]

Our third set of explanatory variables reflects evidence that companies exercise judgment in applying accounting principles and structuring transactions to meet financial reporting targets. OTTI, in nature, are special items – income statement components that are infrequent or unusual. A large body of research examines the role of income-decreasing special items in financial reporting, noting that financial statement users typically discount these as transitory charges and, consequently, managers are strategic in their timing and measurement (e.g., Lipe, 1986; Francis et al., 1996; Riedl, 2004; McVay, 2006; Cain, Kolev, and McVay, 2020). Thus, we consider whether the recognition of OTTI correlates with proxies for "big bath" accounting, income-smoothing, and the contemporaneous recognition of other income-decreasing special items.

To recap, we examine whether the likelihood of having impaired securities, the limitations on the ability and willingness to hold such securities, and opportunistic reporting incentives drive the recognition of OTTI among our sample of nonfinancial firms. Evidence consistent with the first two (last) factors would support (contradict) the notion that nonfinancial firms, on average, abide the spirit and the law of OTTI recognition during the examined period.

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[6] Firms may have alternative sources of funds, e.g., revolving lines of credit. These, however, are typically expensive.
[7] Auditors may provide important oversight to the impairment process, since the core competencies of nonfinancial firms, in theory, do not encompass the valuation of investment securities (DeAngelo, 1984; Becker, DeFond, Jiambalvo, and Subramanyam, 1998). For completeness, we repeat all analyses including an indicator for the presence of a Big 5 auditor (Arthur Andersen was in existence for a portion of our sample period). The is insignificant across specifications, likely due to universal reliance on large auditors by firms in our sample. Our inferences remain unaffected.

3. Sample and descriptive statistics

3.1 OTTI sample

Because the term "other-than-temporary" applies only to securities under the guidance of FAS 115, we start our data collection by identifying the 10-Qs, 10-Ks, and 8-Ks with this phrase. More precisely, the automated EDGAR search process flags filings with paragraphs containing the phrase "other-than-temporary," references to investments, securities, declines or impairments, and some quantitative information. We begin the data collection in 2000 as we note that the frequency of OTTI in prior years is very low.[8] We end the sample in 2013 when the final exposure draft of ASU 2016-01 was issued. To keep the data collection costs manageable, we focus on the S&P 1,500 firms. In addition to excluding financial firms (GICS 40, 60), we do not consider companies in the technology and healthcare industries (GICS 35, 45) – although both technology and healthcare firms tend to have relatively large investment portfolios, these securities 1) often are held for strategic control or single project purposes and 2) the ownership structures/disclosures are more complicated (e.g., holdings through joint ventures). [9] Of the 875 remaining firms, we identify 352 instances of other-than-temporary quarterly impairment disclosures in 124 firms.[10]

In Table 1, we present the distribution of firms with OTTI across the fourteen industries we examine. Although 14 percent of the sample firms report OTTI at least once during the sample period, the number of firm years with OTTI is much smaller at two percent. The frequency varies slightly by industry, with "Food, Beverage & Tobacco" and "Media" topping the list. Notably, nine percent of all firms have OTTI during the Financial Crisis period. We graph the frequency

[8] A likely explanation for the uptick in 2000 is the joint effect of EITF 99-20, which offered clarification on OTTI guidance, and the Dot-com crash, which led to a sharp decline in value a broad cross-section of financial instruments.
[9] Manual review of the data also identified several firms with sufficiently large financing segments to render them "shadow banks" (e.g., GE, Caterpillar, Harley Davidson). We exclude these firms from the analysis.
[10] It is possible that firms recognize OTTI without disclosing them separately due to materiality or opted against using the "other-than-temporary" moniker. We believe, however, that we capture most material OTTI reported during the examined period by the sample firms.

and average magnitude of reported OTTI among the sample years in Figure 1. Prior to the Financial Crisis, on average, 15 quarterly reports per year include OTTI. During the Crisis, that frequency increases to over 70 quarterly reports, consistent with the spike for financial institutions documented by prior research and the contemporaneous market decline of over 30 percent. Over the next four years, OTTI return roughly to the pre-Crisis levels.

3.2 OTTI descriptive statistics

Of the 124 firms with OTTI during the sample period, 52 report one OTTI, 27 have two, 11 have three, 17 have four, and 17 have five or more (up to a maximum of 17 from Masco Corp. and RPM International). In Table 2, we present descriptive statistics on the nature and magnitude of OTTI. We find that most firms report either debt or equity impairments, but very rarely both (we cannot categorize a fifth of impairments due to insufficient disclosure). Equity impairments are more common and larger in the mean and the median. Although the magnitude of OTTI may appear modest with medians below $10 million, on average (in the median) they represent 18 (three) percent of pretax income in the year of recognition.

A third of OTTI are explicitly related to specific investments, while the rest are portfolio-wide or unspecified. This is in line with both the guidance requirement of evaluating each investment on an individual basis and the intuition, as gleaned from investment disclosures, that industrial firms tend to hold relatively undiversified portfolios. The most common distinct type of investment with OTTI is Auction Rate Securities (ARSs). We observe, however, a wide variety of other investments with OTTI, ranging from municipal debentures to public equity.

As evident in Figure 2, outside the Financial Crisis period, more than half of the OTTI are reported in the fourth fiscal quarter. This is noteworthy because SFAS 115 stipulates that an impairment is appropriate at the time a drop below the amortized cost basis is deemed other-than-

temporary, i.e., the guidance does not proscribe an impairment testing schedule that would lead to clustering in a specific fiscal quarter.[11] This, however, is not surprising as nonfinancial firms are more likely to reassess the value of their investment holdings when preparing their annual reports, which, among all else, is audited.

As discussed above, the Financial Crisis lead to a spike in OTTI recognition. Although the market started falling in November of 2007, only five sample firms recognize OTTI in the fourth quarter of 2007, which is not surprising considering the declines were likely deemed temporary at the time. The first half of 2008 saw a decline of about 11 percent in the NYSE and NASDAQ composite indices. Correspondingly, the frequency of OTTI in the first two quarters is 10 and 16, respectively, significantly higher than average. The indices dropped an additional 10 percent in the third and 20 percent in the fourth quarters. OTTI mirror this trend with 19 and 34 instances in each respective quarter. Finally, the bottom of the drop came in March of 2009, and subsequently, the two indices started a slow recovery. Consistent with the final large drop early in the year, there are 15 (21) OTTI in our sample during the first (second) quarter of 2009. Interestingly, in 2010, although still high in OTTI relative to other years, the quarterly distribution is comparable to that in the non-Crisis period – four or five OTTI in each of the interim quarters and 15 in the fourth (untabulated). In summary, the temporal distribution during and outside the Financial Crisis period suggests that executives of nonfinancial firms are responsive to economic factors but are more likely to delay OTTI recognition to the fourth fiscal quarter.

3.3 Descriptive statistics

The decision of nonfinancial firms to invest in financial instruments is complex and remains underexplored in the literature. Examination of the relevant disclosure in the financial

[11] Riedl (2004) notes similar fourth-quarter clustering, absent a regulation-driven reason, in tangible asset impairments.

reports of several sample firms reveals a spectrum of reasons for holding investment securities, including, among others, perceived profit maximizing opportunities, liquidity matching, strategic horizontal or vertical expansion, and competitive pressure. Since a firm needs to have investment securities to recognize OTTI, we drop from our control sample 105 firms that do not report a short-term or a long-term investment at least once during the sample period.

We present the descriptive statistics of the sample firms in Table 3. For ease of exposition, we convert the data from firm year level to firm level by averaging the observations for each firm. We note that OTTI and non-OTTI firms are similar in size and leverage. Notably, OTTI firms hold more cash and short-term investments. In the median (on average), they also hold more (less) long-term investments. To address the effect of differences in the holdings of investment securities on our inferences, as a robustness analysis (section 4.5), we consider a two-stage model framework with a firm year selection model of non-zero or above median investment securities holdings for the first stage.

4. Findings

4.1 OTTI determinants

4.1.1 Univariate analysis

We first consider a univariate comparison of the main explanatory variables between the OTTI and non-OTTI samples using quarterly data (Table 4, Panel A). The OTTI sample includes firm-quarters with OTTI, whereas the non-OTTI sample includes all the quarters of the firms in the examined industries with at least one instance of reported investments and no OTTI over the full sample period. We group the explanatory variables into three categories – those capturing the likelihood that a firm has identified an impaired investment, those indicating that the firm may be

unwilling or unable to hold their investment securities to maturity, and those indicative of strategic reporting incentives.

We note that most of the variables capturing the likelihood an investment impairment exists are statistically different across the two samples in the expected direction. First, investment portfolios are more likely to suffer a decline in value and be evaluated for impairment in a down market. We observe that market performance, measured as the percent change in the value of the S&P 500 index from the prior quarter, is significantly lower among the quarters with OTTI. Second, we conjecture that holding large investment portfolios increases the probability of an impairment. If the large portfolio is heterogenous, this increases the probability that at least one security is impaired. If the large portfolio is homogenous, the materiality of any decline is likely to be greater. Consistent with this notion, we observe that *lag_invest*, an indicator variable taking a value of one for non-zero investments reported in Compustat at the end of the prior fiscal year, is higher for OTTI quarters. Finally, firms with better-staffed accounting departments are better equipped to conduct timelier and more thorough impairment analyses. The higher incidence of OTTI among larger firms, where size is measured by the log of employees, supports this notion.[12]

We expect the likelihood of identifying impaired securities to be greater in the fourth fiscal quarter when the reporting process is more comprehensive and the financial statements are audited. Consistent with the temporal analysis we discussed previously, we note that the incidence of OTTI clusters during the last fiscal quarter. Hence, we include an indicator variable, *q4*, taking a value of one if the observation is from the fourth fiscal quarter. Also, per the impairment guidance, OTTI are likely to be preceded by and/or associated with a significant decline in the value of the underlying investment security. We operationalize this notion using the current and historical

[12] We also consider selling, general and administrative expenses (*xsga*) as an alternative measure for firm size (i.e., the underlying cost of administrative staff). The main inferences are not affected.

levels of accumulated unrealized investment losses. Specifically, we note that *adj_un_loss*, an indicator variable taking a value of one when there is a contemporaneous accumulated unrealized loss in the portfolio, adjusting for the mechanical "recycling gain" effect of recognizing OTTI, is much higher in the quarters with OTTI. The same pattern obtains when we consider how long the investment portfolio has been in a loss position, conditioning on having an unrealized accumulated loss at the beginning of both the OTTI quarter and each of the prior three quarters.

The next group of determinants targets the intent and ability of a firm to hold impaired securities until recovery. First, we conjecture that a history of active trading in investment securities indicates a shorter investment horizon and, thus, weaker intent to hold securities to maturity/recovery. *Trader* is an indicator variable set to one if a firm's active trading, measured by cash proceeds from sales plus cash outflows from purchases of investments as a percentage of net cash flows from investing activities, is above the industry median. Consistent with expectations, we note that *Trader* is higher for OTTI quarters. Next, we posit that liquidity pressure may weaken a firm's ability to hold impaired securities until recovery. We capture the notion through *currentratio*, which we measure as the firm's contemporaneous ratio of current assets to current liabilities. Contrary to expectations, we find that OTTI quarters have a higher current ratio on average, suggesting that short-term liquidity pressures are not the main driver of OTTI recognition.[13] As additional measures of liquidity pressure, we consider free cash flows and leverage, capturing the cash-generating capacity of the firm and pressure to raise cash to cover debt obligations, respectively. The former does not indicate the predicted negative relationship, and the latter is statistically indistinguishable between the OTTI and control samples. Each of the three measures captures liquidity pressure with error and may not necessarily speak directly to a

[13] The inferences are unaffected when we consider the quick ratio instead.

firm's ability and intent to hold its investment securities. Nevertheless, this subset of the analysis fails to support that liquidity needs underly the recognition of OTTI in the sample.

We supplement the analysis with an examination of a firm's market-to-book ratio and history of reporting OTTI. Starting with *mtb*, we note that a high value may indicate a rich set of investment opportunities, implying the need to convert investment securities to cash. A low value, however, also may indicate pressure to generate liquidity. Turning to the data, we note that the OTTI sample has a lower market-to-book ratio than the control sample, supporting the latter point of view. Turning to *prior_otti*, the construct intends to capture a firm's revealed lack of intent or ability to hold the impaired securities in their investment portfolio. Consistent with this notion, we find an economically and statistically significant relationship.

Finally, we examine several measures of opportunistic reporting. Following prior research, we consider whether big bath or income smoothing behavior impacts OTTI reporting. We capture big bath incentives using an indicator variable set to one when a firm reports pre-impairment earnings in the bottom quartile of the sample firms with negative pre-impairment earnings for the quarter. Symmetrically, we identify high smoothing incentives using an indicator variable set to one when the firm reports pre-impairment earnings in the top quartile of positive pre-impairment earnings of the sample firms for the quarter. We do not observe statistical differences in these variables between the OTTI and control samples, i.e., the evidence does not support that either reporting practice influences OTTI recognition. As another measure of possible opportunism, we consider the concurrent reporting of non-OTTI negative special items. By their nature, typical negative special items for nonfinancial firms, such as non-investment impairments and loss on sales of assets or debt extinguishments, should not correlate with the likelihood of an impairment in the securities of other firms. Akin to big bath reporting, firms may prefer to report OTTI in

periods with other impairments or losses, "bundling" the one-time charges. The univariate analysis supports such a dynamic. We qualify this finding, though, as special items cluster in the fourth fiscal quarter and by industry. As a final flag of opportunistic reporting, we construct an indicator variable taking a value of one when a firm just meets or beats by one penny the analysts' consensus. If firms strategically avoid recognizing OTTI in periods they risk missing the analysts' consensus, we should observe lower values for the variable in the OTTI than the control sample. We do not.

When we repeat the analysis using annual data (Table 4, Panel B), the tenor of the findings does not change.

4.1.2 Multivariate analysis

Next, we carry out multivariate analyses. The main regression model takes the form:

$$\Pr(OTTI_{i,t} = 1) = \alpha + \mathbf{B}^{*}\text{Impairment}_{i,t} + \mathbf{\Gamma}^{*}\text{I\&A}_{i,t} + \mathbf{\Delta}^{*}\text{Strategic}_{i,t} + \varepsilon_{i,t} \quad (1)$$

The *Impairment*, *I&A*, and *Strategic* vectors reflect the proxies we discuss previously for the existence of an impairment, the intent and ability to hold the investment securities, and the presence of incentives for opportunistic reporting, respectively. We evaluate the model using a Logit estimator, clustering the standard errors by firm.[14] We present the results for the full quarterly and annual samples in Table 5. In Panel A the dependent variable takes a value of one if a firm reports an OTTI during the quarter (year). To account for the panel structure of the data, we cluster the standard errors by firm and time. The estimated coefficients are consistent with the results from the univariate analysis. Since the data necessary to construct the unrealized loss

[14] We use a Logit estimator Since the dependent variable, *OTTI*, is binary. A number of our treatment variables, however, are also binary. Thus, as a robustness test, we confirm that the inferences are not affected if we use a Linear Probability Model (LPM) as an alternative estimator (Angrist and Pischke, 2009). In addition, we use Tobit to consider whether the determinants of OTTI magnitude are significantly different from those of OTTI incidence. We find results consistent in tenor to the Logit analyses. We do not present the Tobit results because we believe binary outcome regressions more accurately reflect accounting guidance and managerial judgment. While there is discretion in the determination of whether the decline in value is other-than-temporary, once such a determination is made, the loss is recorded in the amount of the decline.

variables do not become available on Compustat until 2006, we conduct the analysis separately for the full sample (columns 1 and 2) and the 2006-2013 period (columns 3 and 4). Starting with the determinants capturing the likelihood of having/identifying an impaired investment, the estimated coefficients are generally statistically significant with the expected sign. Turning to the variables that capture the likelihood of a firm's ability and intent to hold the investment to recovery or maturity, we note that, as expected, both the propensity to trade and prior OTTI associate positively with the reporting of OTTI. Similar to the univariate tests, we note that the estimated coefficients on the variables serving as proxies for liquidity, current ratio and free cash flow, are positive and (generally) significant. Concluding with the vector of variables focusing on strategic reporting, we again fail to find evidence of opportunism. Specifically, with the exception of the weakly significant positive estimated coefficient on *neg_spi* in the full quarterly sample, the variables we consider are either not associated with the incidence of OTTI or associated in the direction opposite of what "opportunistic use" would predict. In summary, the evidence supports that, on average, nonfinancial firms apply the spirit and the law regarding OTTI recognition, rather than use the flexibility in the pre-ASU 2016-01 guidance for opportunistic reasons.

ASU 2016-01 eliminates the AFS classification and OTTI treatment for equity investment securities but does not change the guidance for debt securities. This implicitly reflects the regulator's view of the need to correct the application of SFAS 115 guidance only for equity securities.[15] Thus, we repeat the analysis separately for debt and equity securities (Table 5, Panel

[15] The underlying reasoning is laid out in the discussion of the proposed guidance in 2010: "BC94. The Board believes that the characteristics of a financial instrument are an important factor when deciding how to classify financial instruments. The Board notes that the only way to realize the value of an equity security is to sell it. However, the value of a debt security can be realized by holding the instrument until maturity or a substantial portion of the life of the security, at which time the fair value starts approaching par value. Therefore, the Board decided that in order to qualify for certain changes to be recognized in other comprehensive income, the financial instrument must be a debt instrument because the Board believes that only for debt instruments could unrealized gain and loss reverse if the instrument is held for collection or payment of contractual cash flows." (page 134)

B). We find that the determinants for debt and equity OTTI are generally comparable. We note, however, that reporting incentives may play some role in the recognition of equity OTTI. Specifically, the weakly significant estimated coefficient on *neg_spi* in the pooled sample become significant in the specification with equity OTTI as the dependent variable.

To further control for self-selection and focus on the impairment timing considerations, we next rerun the analysis for the sub-sample of OTTI firms (Table 6). We observe that the estimated coefficients on the variables capturing market performance, presence of material investments, the fourth fiscal quarter indicator, and both contemporaneous and preceding unrealized losses are statistically significant with the expected sign. Among the variables that target investment horizon, the results generally mirror those in the full sample. Consistent with the full-sample analysis, we again do not find evidence that reporting incentives drive the recognition of OTTI.

Acknowledging the Financial Crisis was a shock to capital markets during our sample period, we rerun our analyses for the 2007-2009 period (untabulated). First, we note that nearly half of the OTTI in our sample are reported during that period. Next, we re-estimate the models underlying column 3 in Tables 5 and 6 to examine the determinants of impairments for the pooled sample and OTTI firms, respectively. The estimated coefficients on the variables capturing the change in the market index, presence of material investments, prior trading activity, and market-to-book ratios are not significant. A likely explanation is that during a time of a large economic shock, a firm's idiosyncratic investment activity plays a weaker role in the impairment decision-making process as the incurred losses are market-wide. The results on the other economic and likelihood-of-holding variables remain unchanged.

Notably, we find that during the Financial Crisis, reporting incentives again do not play a role. To underscore the point, we find that firms with an opportunity to smooth earnings by

reporting OTTI are *less* likely to do so. Similarly, in the sample of OTTI firms only, we find that management is less likely to report OTTI when recognizing other negative special items during the period.

Overall, the univariate and multivariate analyses results suggest that OTTI recognition is driven by factors consistent with regulatory guidance rather than opportunism.

4.1.3 OTTI vs. other impairments

In an untabulated analysis, we compare the determinants of OTTI to those of other impairments, such as write-downs of goodwill (Compustat item GDWLIPQ) and write-downs of other assets, such as property, plant, and equipment and inventory (Compustat item WDPQ). Because OTTI should be linked to the underlying performance of the investee firms whereas other impairments should reflect a firm's own economic state and performance, we generally do not expect to observe the same relationships as these with OTTI.[16] We follow Riedl (2004) in including macroeconomic factors, such as the change in the GDP and the median industry change in ROA, as well as firm-specific performance metrics, such as percent change in sales, scaled change in cash flow from operations, and scaled change in pre-impairment earnings. We observe that the fourth quarter indicator is significant for all impairments, consistent with prior research. As expected, macroeconomic factors are stronger determinants for OTTI than for impairments of other assets. In contrast, the measures of the firm's current period performance are significant explanatory variables for goodwill and other asset impairments but not for OTTI. Moreover, OTTI-specific variables such as prior investments, trading history, and unrealized losses are significant

[16] First, we check whether OTTI are ever included as part of the write-down variable (WDP/WDPQ) available in Compustat. Of firm-quarters with OTTI, only ten percent have a non-zero write-down variable during the period and of those it is a mix of whether OTTI is included or not. We adjust the Compustat variable to exclude OTTI whenever appropriate. As a general observation for researchers interested in studying OTTI, we caution Compustat may not be a reliable source for identifying OTTI.

determinates for OTTI but, as expected, have little to no association with other impairments. Collectively, this is consistent with the notion firm performance significantly impacts the impairment of capital and operating assets, whereas investment-specific factors drive the recognition of OTTI.

4.2 Market reaction to OTTI

We supplement the determinant analysis by examining the equity market's response to OTTI. Extant research provides evidence of significant market reactions to fair value disclosures made by financial institutions, which suggests that such disclosures are informative to investors (e.g., Badertscher, Burks, and Easton, 2014). Considering the orthogonality of OTTI to the primary lines of business for nonfinancial firms, it is unclear whether or not statement users perceive OTTI as decision-useful. Specifically, although all financial statement data should be informative to investors, the effect will vary with the expected level of persistence (Lipe 1986). Research on the value-relevance of OCI components suggests some possible dynamics for OTTI – the items in OCI are mostly transitory, as are OTTI, suggesting a $1 for $1, rather than 1/r valuation (Chambers, Linsmeier, Shakespeare, and Sougianis, 2007; Kanagaretnam, Mathieu, and Shehata, 2009).

If OTTI are "recycled" losses for instruments carried at fair value, meaning they are first recognized as unrealized losses in OCI, the market may have already incorporated the information prior to the income statement recognition. Thus, any reaction to unrealized gains/losses would suggest a weaker reaction to subsequent OTTI. Extant research, however, suggests that unrealized gains and losses are not always fully priced. For example, Dhaliwal, Subramanyam, and Trezevant (1999) find that CI is incrementally informative for US financial, but not nonfinancial firms, and Frendy and Semba (2017) observe the same relationship in Japan. Moreover, Goncharov and Hodgson (2011) offer evidence that unrealized gains and losses are on the cusp of being value-

relevant. Thus, we leave the value-relevance of OTTI in nonfinancial firms as an open empirical question.

We build on extant research examining impairments in the financial sector to assess how equity investors perceive OTTI. Specifically, evidence of a non-zero association between earnings announcement returns and OTTI would be consistent with revision of the investors' priors, i.e., it would imply that OTTI are informative. The regression model takes the form:

$$Ret_{i,t} = \beta * forecast\_error_{i,t} + \mathbf{\Gamma} * OTTI_{i,t} + \gamma * spiq + \mathbf{\Theta} * FE + \varepsilon_{i,t} \quad (2)$$

The dependent variable is the three-day buy-and-hold risk-adjusted abnormal return centered on the earnings announcement date. *Forecast_error* is the difference between the I/B/E/S-reported actual earnings for the respective firm quarter and the latest equity analysts' consensus median. The variable of interest is the magnitude of the firm-reported other-than-temporary impairment charge for the quarter, also distinguishing between OTTI related to debt (*d_otti*) and equity (*e_otti*) securities. As a benchmark, we also include non-OTTI special items. We conduct the analysis in the subsample of firms that report OTTI at least once during the examined period. We scale the continuous independent variables by the market value of equity at the beginning of the fiscal quarter and winsorize them at the top and bottom one percent.[17] We define the vector of fixed effects alternatively as industry and period or firm indicators; in the former specification, we cluster the standard errors by the firm. We evaluate the model as a pooled regression using an ordinary least squares estimator. We interpret significant estimated coefficients on *t_otti* (*d_otti, e_otti*, and *un_otti*) as evidence that the reporting of the impairment, after controlling for overall earnings news, is informative to equity investors.

[17] Prior to scaling *ForecastError*, we convert the per share forecast error to USD multiplying by the diluted number of shares. Moreover, since *OTTI* is bound from below by zero, we winsorize it only at the 99th percentile, using the subsample of firm-quarter with firm-reported OTTI.

This empirical strategy includes several limitations First, we carry out the analysis only on the subsample of 169 OTTI disclosed during the earnings announcement window. For the other half of the sample OTTI were disclosed in periodic reports. Second, the earnings announcement is an information-heavy period, raising the bar for a non-core income statement component such as OTTI to gain the attention of equity investors. Finally, although I/B/E/S generally strips non-recurring charges from its consensus earnings forecasts and respective actual earnings, it is possible that *Forecast_error* already incorporates OTTI. Collectively, these factors bias against finding a significant relationship between *Ret* and *OTTI*, making the unequivocal interpretation of non-significant results challenging. A significant estimated coefficient on *OTTI*, however, would offer strong evidence that equity investors find OTTI decision-useful.

We present the regression results in Table 7. Consistent with extant research, we document a significantly positive association between the analysts' forecast error and the three-day earnings announcement return across specifications. Turning to *OTTI*, the estimated coefficients on the aggregate variable (columns 1 and 2) are insignificant. Disaggregating the variable (columns 3 and 4), however, paints a nuanced picture. Specifically, the estimated coefficients on both debt- and equity-related OTTI are statistically significant (the OTTI we cannot classify as either, *un_otti*, do not load in the model). Notably, they are of different signs – debt-related OTTI (*d_otti*) imply a decrease in stock price over the three-day earnings announcement window, whereas equity-related OTTI (*e_otti*) imply an increase. Although characterizing the implications of the estimated coefficients' sign is beyond this study's scope, we note that the effect may relate to the importance of debt, but not equity, to the firm's liquidity needs or the expectation of future realized gains on equity, but not debt, securities. Notably, the estimated coefficients on non-OTTI special items,

which we include as an additional control, are insignificant. Collectively, the results of this analysis suggest that OTTI reporting is deemed informative by capital market participants.

4.3 ASU 2016-01 effects

Building on the evidence thus far, a natural follow-up question is whether nonfinancial firms take real actions in response to the enactment of ASU 2016-01, which relegates unrealized investment gains and losses on equity securities to net income, effectively eliminating the respective OTTI. Unless the equity component of a firm's investment portfolio is hedged, the regulatory change would lead to an increase in the volatility of the non-operating components of income, *ceteris paribus*. If firms consider this effect harmful, they may change their approach to investment in financial instruments. Indeed, anecdotal evidence supports nonfinancial firms changing their approach to investing as a result of ASU 2016-01. For example, PepsiCo, whose strongly worded comment letter we cite in Appendix A, liquidated their available-for-sale securities portfolio before the 2018 adoption, stating as a reason, "[…] which reduced the risk and volatility of these investments in our income statement in the future" (PepsiCo 2017 10-K).

We address the issue using a univariate framework aimed at assessing whether the investment holdings and/or the volatility of non-operating income change with the adoption of the new rule for our sample (OTTI firms and control firms which have quarterly data from 2014 through 2019). We present the results in Table 8. Specifically, for each sample firm we calculate the change in the average level of short-term investments as the difference between the average Compustat item IVSTQ in the eight quarters of 2018-2019 minus the average in 2014-2017. We also calculate the change in the average volatility as the difference in the standard deviation of this account over the same period. We repeat the same calculations for long-term investments (Compustat item IVAOQ), Interest and Related Expenses (Compustat item XINTQ), and Non-

Operating Income (Compustat item NOPIQ). We observe that when scaled by total assets, both the levels and the volatility of short-term and long-term investments on the balance sheets of the sample firms decline from the pre to the post period suggesting an on-average shift towards holding fewer volatile securities. Although we do not observe the firms' specific holdings, we note that the overall market experienced an increase in volatility over the examined time period as evidenced both by the VIX index, which captures the volatility of the S&P500, and the VXN index, which reflects the volatility of the NASDAQ. Specifically, both the VIX and VXN increased both in the mean and median from the pre to the post period. Thus, the change in the balance sheets of the sample firms plausibly reflects changes in investment choices rather than macroeconomic shifts.

Turning to the income statement, we note that the volatility of XINTQ declines, but the volatility of NOPIQ increases slightly over the examined periods. This evidence is qualified by the data limitations associated with the examined variables – not only nonfinancial firms exhibit great diversity in reporting these data, but most do not separate the holdings in sufficient detail to track the composition of portfolio (and thus additions/subtractions of investments). As such, we leave a rigorous analysis of the issue to future research. We note, however, that even among financial firms, the effect of ASU 2016-01 remains open for debate. In particular, three contemporaneous papers examine the effect of the regulatory pronouncement using insurance firms as the experimental setting, capitalizing on the mandatory disclosure of investment portfolios at an individual security level, homogeneity of a single industry, and large holding levels. Specifically, Amornsiripanitch, Huang, Kwon, and Lin (2022) conclude that public insurance firms reduce their equity holdings and Song, Wang, and Wheeler (2022) find a reduction in equity portfolio volatility. In contrast, Kim, Kim, Marquardt, and Shin (2022) conclude that the examined insurance firms do not reduce investment security holdings or risk.

4.4 Additional impairment dynamics

We consider the possibility that under the pre-ASU 2016-01 regime, firms only recognize impairments when pressured by regulators. To this end, we examine the SEC comment letters and referenced rules for all the firms in our sample. We find only two instances of comment letters related to the reporting of an other-than-temporary impairment in our sample (MASCO Corp. and SHFL Entertainment Inc.). We conclude that OTTI recognition by the sample firms is not spurred by regulatory pressure, supporting again that management applied the guidance appropriately. We also consider whether OTTI are highlighted as unusual or value-irrelevant in non-GAAP reconciliation disclosures and for the most part do not observe their inclusion, even for high-magnitude impairments.

4.5 Selection model for investment security holdings

Finally, we directly address self-selection in investment holdings. Specifically, we develop a firm year selection model guided by factors likely to increase investments as identified in the finance literature (e.g., Opler, Pinkowitz, Stulz, and Williamson, 1999; Bates, Kahle, and Stulz, 2009; Duchin, Gilbert, Harford, and Hrdlicka, 2017). It is important to note that this literature examines the determinants of holding not only HTM and AFS securities but also cash and other investments. These studies document that holding financial assets is positively associated with growth opportunities and riskier cash flows and negatively associated with the ability to access capital markets. The continued increase in company liquid assets holdings underscores the necessity to better understand the determinants of both cash holdings and investment holdings. As the Wall Street Journal noted on April 23, 2021: "Nonfinancial corporations in the euro area, Japan and the U.S. now sit on nearly $10 trillion of currency and deposits, about twice the level of a decade ago" (Bird 2021).

In Table 9, Panel A, we present the results of the selection model. As noted before, we model the choice of holdings investment securities at the annual level, focusing on the variables found to be significant determinants in prior research. Acknowledging the panel structure of the data, we also include industry and year fixed effects. In column (1), we examine the full sample of nonfinancial firms in our sample period, 2000-2013. This includes firms with OTTI, control firms which have investments in at least one year during the sample period, and other firms in these industries previously excluded due to the absence of investments. The dependent variable is an indicator variable set to one if the firm has non-zero short-term investments (IVST) or non-zero long-term investments (IVAO) in the Compustat annual file and zero otherwise.

The results suggest that, for this sample, the probability of holding investments in a given year is significantly positively associated with firm size, cash, and growth opportunities as measured by the market-to-book ratio. Moreover, it is significantly negatively associated with working capital liabilities (that may need cash repayment soon), leverage (ability to access the debt market), and, empirically, with free cash flows. Inconsistent with prior research, the propensity to hold investments is negatively associated with capital expenditures and not associated with dividends. This suggests that some of the dynamics of cash holdings do not translate to less liquid investment holdings. We note the relatively low explanatory power of our model with pseudo R^2 of 9.1 percent – although many of the explanatory variables are statistically significant, the model leaves out factors explaining the variance in investment choices. We do not employ a selection model for our main analyses of impairment determinants, as the incidence of OTTI is quarterly. As a robustness check, in Panel B, we re-estimate equation (1) for the full annual sample, including as additional control the Inverse Mills Ratio from the model in Panel A. We no longer limit the sample to firms holding investment securities, as the first stage models the decision to hold

investments for all nonfinancial firms in our sample. The main inferences are unaffected, confirming our conclusion that OTTI recognition in nonfinancial firms appears to be driven by economic and likelihood of holding determinants, rather than opportunistic reporting incentives.[18]

In columns (2) and (3) of Table 9, Panel A, we re-estimate the predictive model on a later sample period. As discussed above, ASU 2016-01 was implemented in 2018, and it is possible that it impacted the choice to hold equity securities due to the required income statement recognition of unrealized gain/loss. We report the results of the Probit selection model in the four years pre-rule change in column (2) and two years post rule change in column (3). We observe that the determinants of holding investment securities change in the years after the new guidance – leverage, growth opportunities, and working capital liabilities are no longer significantly associated with the decision to hold investments. These results suggest that the post ASU 2016-01 decline in the level of holdings documented in Table 8 is not driven by nonfinancial firms with capital constraints or limited growth opportunities.

5. Conclusion

We examine other-than-temporary impairments on investment securities among S&P 1,500 nonfinancial firms. We undertake the analysis motivated by the paucity of research on the accounting treatment of "Wall Street" assets held by "Main Street" firms. The recent enactment of ASU 2016-01, which eliminates the option to classify equity investment securities as AFS under the FAS 115 nomenclature, despite the strong pushback from nonfinancial firms during the deliberation process, also serves as an impetus.

[18] We also consider a selection model using as dependent variable an indicator that takes a value of one for the observations with "high investments" measured as above the median asset value of investments for an industry. The results, including those in the second stage, are qualitatively unchanged except for a loss of significance on the *lag_invest* and *currentratio* variables.

Using hand-collected data, we present descriptive evidence on the incidence of OTTI among the examined firms. We note that OTTI are common across industries and, although they peak during the fourth fiscal quarter, are well represented in quarters one through three. We observe that economic factors capturing the likelihood of having an impaired investment and the limitations to the intent and ability to hold such investment to recovery are strong predictors of OTTI recognition. In contrast, common measures of opportunism in financial reporting do not appear to associate with OTTI. We note that OTTI related to both debt and equity investments are significantly associated with equity returns pointing to their decision-usefulness to statement users. Overall, our results suggest that nonfinancial firms apply the relevant guidance appropriately, and the capital markets pay attention to the resultant disclosure.

We also offer preliminary evidence on the effect of ASU 2016-01 among nonfinancial firms, noting that investments in financial instruments appear to have declined after the regulatory intervention. To the best of our knowledge, this is the first study to offer insights into the characteristics of OTTI among nonfinancial firms. Our findings suggest that an omnibus rule-based approach to regulation informed by a specific sector of the economy may have non-trivial externalities for the other sectors. More research is needed on the application and impact of fair value accounting treatment of equity securities among various constituencies. In addition, questions remain on the optimal accounting treatment of debt securities by financial and non-financial firms.

Appendix A
Examples of comment letters to new guidance

To the May 2010 draft

PepsiCo, Inc.:
"We believe that for a nonfinancial institution that is not involved in the trading of equity securities, this rule will lead to an inappropriate representation of the operations of the company. We are particularly concerned with recognizing the changes in the valuation of the securities that per Topic 320 are currently classified as "Available-for-Sale". These securities generally represent investments entered into for long-term strategic purposes, and hence changes in their fair value should not be included in an entity's core operating results. We fear that this would also result in unnecessary fluctuations that would not be indicative of any real trend in the operations of the underlying investment."

Intel Corp.:
"Our investment philosophy for our equity portfolio is to further our strategic objectives and support our key business initiatives… the recognition of fair value changes in net income would result in misleading and inappropriate volatility because these changes do not represent realized cash flows representative of our core cash generating activities."

DirecTV Group, LLC.:
"We believe that the ED should be revised to allow non-financial institutions to continue to report changes in the fair value of marketable equity securities in other comprehensive income… impairment charges and realized gains and losses would continue to be recognized in net income under the existing model."

United Technologies Corp.:
"…for investments that are non-trading we believe that the current recognition of gains and losses through comprehensive income is best. This is based upon management's view of these investments as being strategic in nature with a view towards increased investment or acquisition in the future and not to benefit from financial statement gains."

Air Products and Chemicals, Inc.:
"While these available for sale securities are actively traded investments, we have no intention to liquidate the stock in the foreseeable future. In turn, the recognition of any gains and losses associated with these investments would introduce earnings volatility which is misleading to the readers of our financial statements and not consistent with our business intent."

NextEra Energy, Inc.:
"We recommend that the current other than temporary impairment model that considers the ability and intent to hold a security be retained."

To the February 2013 draft

Google Inc.:
"We make decisions on holding or selling portfolio securities based on our liquidity needs and to achieve a targeted yield, not on the cash flow characteristics criterion of the investments. … Recording unrealized gains and losses on equity securities through the income statement causes volatility within Other Income and Expense… Additionally, we feel that including both realized and unrealized gains and losses on our equity securities in the income statement misrepresents our investment results and is not consistent with our investment objectives as it implies a short-term trading perspective rather than our longer term portfolio management view."

Verizon Communications Inc.:
"…believes that the FASB's proposal to recognize change in FV-NI for investments in equity instruments may create unexpected volatility in net income with questionable benefit to users of financial statements. It may also create differences in accounting for debt and equity investments that are held for the same business purpose and may dis-incent entities from investing in equity instruments…"

Marriott International, Inc.:
"We continue to believe the Proposal provides investors with more useful, transparent and relevant information about an entity's exposure to financial instruments so long as the entity is a financial institution. However, companies such as Marriott, that operate in commercial industries (i.e. non-financial institutions), use financial instruments very differently from financial institutions and the Proposal does not reflect this distinction."

Appendix B
Variable Definitions

Variable	Description	Definition
Other-than-temporary impairment variables:		
t_otti	Total OTTI	Total reported other-than-temporary impairment for period *t*.
d_otti	Debt OTTI	Total debt-related other-than-temporary impairment for period *t*.
e_otti	Equity OTTI	Total equity-related other-than-temporary impairment for period *t*.
un_otti	Uncertain OTTI	Total uncertain other-than-temporary impairment for period *t*.
otti	Reported OTTI	Indicator set equal to 1 if the firm recorded an OTTI in the current period *t*, and 0 otherwise.
debt	Reported Debt OTTI	Indicator set equal to 1 if the firm recorded a debt-related OTTI in the current period *t*, and 0 otherwise.
equity	Reported Equity OTTI	Indicator set equal to 1 if the firm recorded an equity-related OTTI in the current period *t*, and 0 otherwise.
Variables that capture likelihood of having an impaired investment:		
chg_sp500	Change in S&P500	% change in the S&P 500 from prior quarter-end to current quarter-end
lag_invest	Prior Year Investment	Indicator set equal to 1 if the sum of short-term and long-term investments is non-zero in period *t-1*. ($ivst_{t-1}$+$ivao_{t-1}$) > zero as of the prior fiscal period, and 0 otherwise.
q4	4th Quarter	Indicator set equal to 1 if the 4th quarter of the firm's fiscal year, and 0 otherwise.
size	Firm Size	Firm Size as a measure of employees. Log(1+emp_t)
adj_un_loss	Accumulated Unrealized Loss	Indicator set equal to 1 if adjusted change in marketable securities (msa) is negative in current period *t*, and 0 otherwise. msa_t-msa_{t-1}- t_otti_t
lag_un_loss	Unrealized Loss Position in Prior Period	Indicator set equal to 1 if prior period adjusted change in marketable securities (msa) negative, and 0 otherwise. msa_{t-1}-msa_{t-2}- t_otti_{t-1}
lag3_un_loss	Unrealized Loss Position for 3 Periods	Indicator set equal to 1 for three consecutive periods of negative change in marketable securities (msa), and 0 otherwise.
Variables that capture likelihood of firm not able/willing to hold		
trader	High Trading Activity	Indicator set equal to 1 if the level of investment trading is above the median for industry in the prior period *t-1*, zero otherwise. Investment trading = [(siv_{t-1}+$ivch_{t-1}$)/abs($ivncf_{t-1}$)]
currentratio	Current Ratio	Measure of a firm's ability to pay short-term obligations (act_t-$ivst_t$)/lct_t.
fcf	Free Cash Flow	Measure of a firm's free cash flow ($oancf_t$-$capx_t$-dv_t)/at_t.
leverage	Leverage	Measure of the firm's total debt scaled by total assets (dlc_t+$dltt_t$)/at_t.
mtb	Market-to-Book	Measure of the firm's growth opportunities ($mkvalt_t$/seq_t).
prior_otti	Prior Period OTTI	Indicator set equal to 1 if the firm recorded an OTTI in one of the prior 4 quarters, and 0 otherwise.

Variables that capture reporting incentives		
bath	Big Bath Accounting	Indicator set equal to 1 if the firm's pre-impairment earnings (ni_t+t_otti_t) is in the bottom quartile of all negative pre-otti earnings for the period *t*, zero otherwise.
smooth	Income Smoothing	Indicator set equal to 1 if the firm's pre-impairment earnings (ni_t+t_otti_t) is in the top quartile of all positive pre-otti earnings for the period *t*, zero otherwise.
neg_spi	Negative Special Items	Indicator set equal to 1 if the firm reported other negative special items (spiop<0) in period t, zero otherwise.
just_meet	Just Meet Earnings Expectations	Indicator set equal to 1 if the firm just met analyst expectations (Error < 0.02).
Control variables		
capex	Capital Expenditures	Measure of a firm's capital expenditures scaled by total assets ($capx_t/at_{t-1}$).
cash	Cash Holdings	Measure of a firm's cash holdings scaled by total assets (ch_t/at_t).
dividends	Dividends	Indicator set equal to 1 if the firm issued dividends (dv) in period *t*
forecast_error	Forecast Error	Measure of the mean forecast error scaled by market value of equity at the beginning of the fiscal period *t*.
liabilities	Liabilities	Measure of the firm's current liabilities scaled by total assets in period t (lct_t/at_t).
spiq	Special Items	Measure of the quarterly reported special items (spiq) scaled by market value of equity at the beginning of the fiscal period *t*.

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Figure 1
Frequency and Magnitude of Reported OTTI

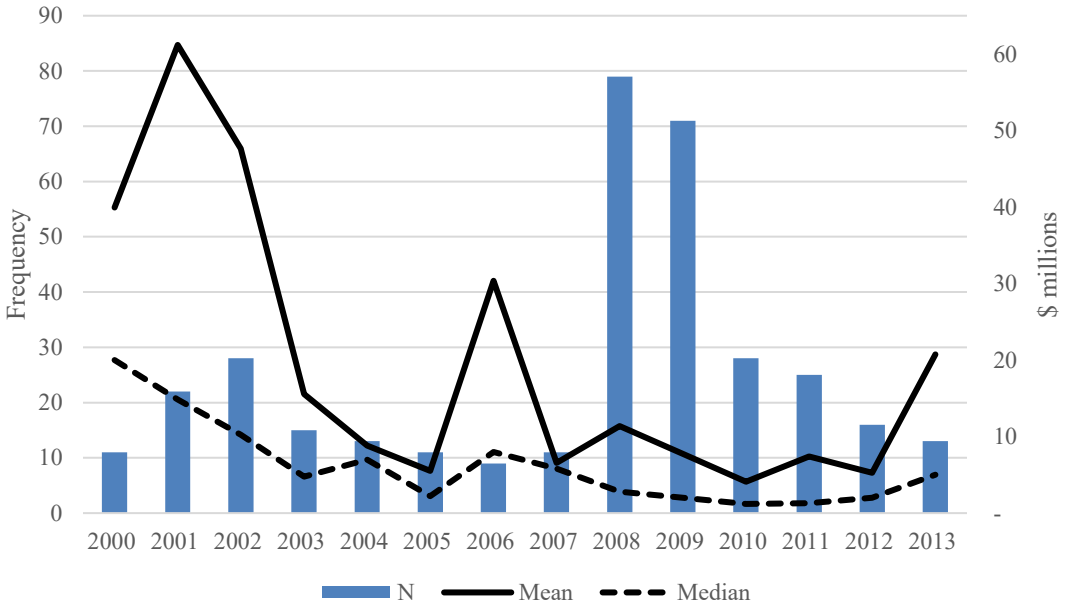

Figure 2
Timing of Reported OTTI

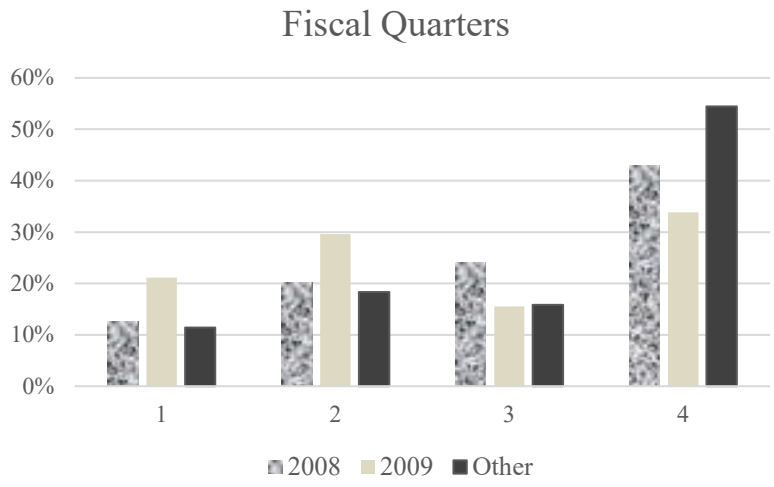

Table 1
Industry Composition

		Full Sample Period (2000-2013)				Crisis Period (2008-2009)	
		FIRMS		FIRM YEARS		FIRMS	
		N	% OTTI	N	% OTTI	N	% OTTI
1010	Energy	71	9.9%	1073	1.2%	70	5.7%
1510	Materials	74	23.0%	1018	3.4%	73	13.7%
2010	Capital Goods	116	17.2%	1615	3.7%	112	12.5%
2020	Commercial & Professional Services	50	26.0%	685	2.3%	50	18.0%
2030	Transportation	31	25.8%	387	2.8%	30	20.0%
2510	Automobiles & Components	19	10.5%	250	1.2%	19	5.3%
2520	Consumer Durables & Apparel	64	21.9%	874	2.7%	63	14.3%
2530	Consumer Services	62	9.7%	747	1.6%	57	7.0%
2540	Media	35	20.0%	413	4.6%	32	6.3%
2550	Retailing	94	13.8%	1177	2.5%	94	7.4%
3010	Food & Staples Retailing	16	18.8%	211	2.4%	16	6.3%
3020	Food, Beverage & Tobacco	43	25.6%	528	4.2%	43	16.3%
3030	Household & Personal Products	15	6.7%	195	1.0%	14	0.0%
5510	Utilities	80	2.5%	1041	0.4%	79	1.3%
	TOTAL	770	16.1%	10,214	2.5%	752	10.0%

Table 2
Descriptive Statistics of Other Than Temporary Impairments

		N	Mean	Median	Maximum
t_otti	Total OTTI	352	17.0	3.7	776.0
d_otti	Debt OTTI	112	7.5	1.8	88.7
e_otti	Equity OTTI	187	25.0	5.0	776.0
un_otti	Uncertain OTTI	65	7.2	2.0	108.0
ars	Auction Rate Securities	76	6.8	1.7	88.7
abs	Asset Backed Securities	4	6.8	2.9	21.0
muni	Municipal Securities	4	1.2	1.1	2.1
pri_e	Private Equity	57	17.3	6.5	180.6
pri_d	Private Debt	7	13.1	0.5	82.9
pub_e	Public Equity	82	34.3	4.0	776.0
pub_d	Public Debt	15	7.8	3.0	35.6
un_e	Uncertain Equity	52	16.5	5.1	100.7
un_d	Uncertain Debt	10	10.3	3.6	47.4
other	Other/Unclear	62	6.9	2.0	108.0
strategic	Strategic Investments	28	32.4	8.2	361.0
few	Few (1 or 2) Securities	105	18.7	3.9	361.0
fanfred	Fannie/Freddie	2	18.0	18.0	20.0
lehman	Lehman	4	2.9	2.5	5.0
non_mkt	Nonmarketable Securities	12	4.4	1.3	27.0
collect	Time to collect (minutes)	352	6.8	5.0	35.0

Mean, median, and maximum are presented in millions.

Table 3
Firm-Level Descriptive Statistics

		OTTI Firms (avg for all years)			Non-OTTI Firms with Investments		
		N	**Mean**	**Median**	**N**	**Mean**	**Median**
		(1)	(2)	(3)	(4)	(5)	(6)
ch	Cash	124	583	244	646	447	118
ivst	Short-Term Investments - Total	124	157	18	646	81	7
ivao	Investment and Advances - Other	124	135	17	646	387	6
ivaeq	Investment and Advances - Equity	124	184	5	646	235	0
msa	Marketable Securities Adjustment	124	5.8	0	645	3.7	0
cisecgl	Comp Inc - Securities Gains/Losses	124	0.4	0	645	-0.1	0
siv	Sale of Investments	123	346	20	644	322	2
ivch	Increase in Investments	124	455	26	640	349	3
ppent	Property, Plant and Equipment - Total (Net)	124	2,237	649	646	3,383	669
intan	Intangible Assets - Total	124	1,818	350	643	1,625	247
at	Assets - Total	124	7,975	2,849	646	8,917	2,348
dltt	Long-Term Debt - Total	124	1,835	677	646	2,347	534
ceq	Common/Ordinary Equity - Total	124	2,691	1,174	646	2,903	885
mkvalt	Market Value - Total	124	9,022	2,789	646	7,235	2,092
revt	Revenue - Total	124	8,183	2,513	646	6,603	2,034
oiadp	Operating Income After Depreciation	124	780	284	646	773	201
xint	Interest and Related Expense - Total	123	123	49	642	165	39
spi	Special Items	124	-77	-18	646	-67	-10
nopi	Non-operating Income (Expense)	124	51	8	646	66	5
pi	Pretax Income	124	633	199	646	614	147
ib	Income Before Extraordinary Items	124	430	124	646	384	93
dv	Cash Dividends (Cash Flow)	124	168	39	646	148	20
ni	Net Income (Loss)	124	429	131	646	375	90
epsfx	Earnings Per Share (Diluted) – Excl. Extraordinary Items	124	1.90	1.40	646	1.70	1.60

Table 4
OTTI Determinants - Univariate Analysis

Panel A: Quarterly Observations

		OTTI = 1			OTTI = 0			Difference			
		N	Mean	Median	N	Mean	Median	MeanDiff		MedianDiff	
Variables that capture likelihood of having an impaired investment:											
chg_sp500	−	352	-0.015	0.009	40,289	0.008	0.016	-0.023	***	-0.007	**
lag_invest	+	350	0.84	1.000	40,060	0.622	1.000	0.218	***	0.000	***
size	+	349	2.737	2.526	39,788	2.329	2.197	0.407	***	0.329	***
q4	+	352	0.474	0.000	40,289	0.249	0.000	0.225	***	0.000	***
adj_un_loss	+	229	0.799	1.000	21,418	0.14	0.000	0.659	***	1.000	***
lag_un_loss	+	229	0.550	1.000	21,400	0.123	0.000	0.428	***	1.000	***
lag3_un_loss	+	229	0.384	0.000	21,400	0.076	0.000	0.308	***	0.000	***
Variables that capture likelihood of firm not able/willing to hold:											
trader	+	352	0.608	1.000	40,289	0.336	0.000	0.272	***	1.000	***
currentratio	−	337	2.087	1.776	38,723	1.778	1.538	0.310	***	0.238	***
fcf	−	351	0.017	0.012	39,507	0.008	0.007	0.009	***	0.005	***
leverage	+	344	0.256	0.26	39,151	0.248	0.246	0.008		0.014	
mtb	?	350	1.619	1.379	39,870	1.797	1.471	-0.178	***	-0.092	***
prior_otti	+	352	0.517	1.000	40,289	0.02	0.000	0.497	***	1.000	***
Variables that capture reporting incentives:											
bath	+	352	0.199	0.000	40,289	0.233	0.000	-0.034		0.000	
smooth	+	352	0.293	0.000	40,289	0.261	0.000	0.032		0.000	
neg_spi	+	352	0.102	0.000	40,289	0.066	0.000	0.036	***	0.000	***
just_meet	−	352	0.085	0.000	40,289	0.098	0.000	-0.013		0.000	

Statistical significance was measured as the t-test for mean and Wilcoxon rank-sum test for median differences.

Table 4 (Continued)
OTTI Determinants - Univariate Analysis

Panel B: Annual Observations

		OTTI = 1			OTTI = 0			Difference			
		N	Mean	Median	N	Mean	Median	MeanDiff		MedianDiff	
Variables that capture likelihood of having an impaired investment:											
chg_sp500	−	256	-0.021	0.035	9,958	0.034	0.090	-0.055	***	-0.055	***
lag_invest	+	256	0.824	1.000	9,958	0.613	1.000	0.211	***	0.000	***
size	+	255	2.753	2.565	9,847	2.314	2.197	0.438	***	0.368	***
adj_un_loss	+	250	0.82	1.000	6,655	0.154	0.000	0.666	***	1.000	***
lag_un_loss	+	246	0.537	1.000	9,396	0.116	0.000	0.420	***	1.000	***
Variables that capture likelihood of firm not able/willing to hold:											
trader	+	256	0.289	0.000	9,958	0.147	0.000	0.142	***	0.000	***
currentratio	−	243	1.984	1.603	9,568	1.780	1.580	0.204	***	0.023	
fcf	−	256	0.035	0.034	9,862	0.032	0.032	0.003		0.002	
leverage	+	256	0.256	0.246	9,924	0.245	0.259	0.011		-0.013	
mtb	?	256	1.700	1.417	9,832	1.794	1.485	-0.094		-0.068	**
prior_otti	+	256	0.387	0.000	9,958	0.015	0.000	0.372	***	0.000	***
Variables that capture reporting incentives:											
bath	+	256	0.051	0.000	9,958	0.033	0.000	0.017		0.000	
smooth	+	256	0.262	0.000	9,958	0.234	0.000	0.027	*	0.000	*
neg_spi	+	256	0.184	0.000	9,958	0.144	0.000	0.039		0.000	
just_meet	−	256	0.098	0.000	9,958	0.105	0.000	-0.007		0.000	

Statistical significance was measured as the t-test for mean and Wilcoxon rank-sum test for median differences.

Table 5
OTTI Determinants - LOGIT Regression on All Firms with Investments

Panel A: All impairments

		Sample Period: 2000-2013						Sample Period: 2006-2013					
		Quarterly (1)			Annual (2)			Quarterly (3)			Annual (4)		
VARIABLES	**Sign?**	**Coefficient**		**St.Err**	**Coefficient**		**St.Err.**	**Coefficient**		**St.Err**	**Coefficient**		**St.Err.**
Variables that capture likelihood of having an impaired investment:													
chg_sp500	–	-4.231	***	(1.080)	-2.457	**	(0.982)	-1.439		(1.303)	-1.619	**	(0.766)
lag_invest	+	0.761	***	(0.210)	0.934	***	(0.262)	0.501	*	(0.285)	0.368		(0.260)
size	+	0.174	***	(0.059)	0.265	***	(0.087)	0.182	***	(0.070)	0.249	***	(0.094)
q4	+	1.081	***	(0.173)				0.846	***	(0.231)			
adj_un_loss	+							2.553	***	(0.287)	3.097	***	(0.246)
lag_un_loss	+							1.044	***	(0.283)	1.047	***	(0.270)
lag3_un_loss	+							0.075		(0.239)			
Variables that capture likelihood of firm not able/willing to hold:													
trader	+	0.607	***	(0.146)	0.523	***	(0.172)	0.354	*	(0.207)	0.066		(0.140)
currentratio	–	0.186	***	(0.041)	0.194	***	(0.057)	0.225	**	(0.093)	0.215	***	(0.091)
fcf	–	4.061	***	(1.182)	0.417		(1.111)	7.826	***	(2.869)	1.122		(1.107)
leverage	+	0.665	*	(0.389)	0.352		(0.840)	1.074		(0.732)	1.198		(0.842)
mtb	?	-0.170	*	(0.090)	-0.074		(0.088)	-0.347	**	(0.145)	-0.100		(0.092)
prior_otti	+	3.677	***	(0.220)	3.723	***	(0.254)	3.096	***	(0.330)	3.030	***	(0.351)
Variables that capture reporting incentives:													
bath	+	-0.210		(0.194)	0.356		(0.392)	-0.221		(0.302)	0.395		(0.514)
smooth	+	-0.210		(0.186)	-0.469	**	(0.199)	-0.327		(0.316)	-0.518	*	(0.278)
neg_spi	+	0.331	*	(0.186)	0.157		(0.208)	0.441		(0.274)	0.200		(0.222)
just_meet	–	-0.133		(0.190)	-0.016		(0.223)	0.038		(0.263)	0.091		(0.298)
Constant		-7.239	***	(0.358)	-5.866	***	(0.644)	-8.080	***	(0.576)	-6.895	**	(0.605)
pseudo R-sq		0.282			0.240			0.426			0.423		
Observations		37,090			9,561			19,246			6,488		

Panel B: Debt and Equity impairments separately

		Sample Period: 2000-2013						Sample Period: 2006-2013					
		Debt OTTI (1)			Equity OTTI (2)			Debt OTTI (3)			Equity OTTI (4)		
VARIABLES		Coefficient		St.Err	Coefficient		St.Err.	Coefficient		St.Err	Coefficient		St.Err.
Variables that capture likelihood of having an impaired investment:													
chg_sp500	–	-5.816	***	(1.956)	-3.529	***	(0.907)	-2.359		(1.624)	-0.696		(1.130)
lag_invest	+	2.799	***	(0.723)	0.633	**	(0.289)	2.485	***	(0.945)	1.007	**	(0.509)
size	+	0.147		(0.128)	0.185	*	(0.110)	0.177		(0.134)	0.054		(0.149)
q4	+	0.473	*	(0.310)	1.208	***	(0.197)	0.314		(0.302)	0.994	***	(0.292)
adj_un_loss	+							2.521	***	(0.530)	2.504	***	(0.366)
lag_un_loss	+							1.355	***	(0.344)	1.211	***	(0.323)
lag3_un_loss	+							0.808	**	(0.368)	-0.511		(0.412)
Variables that capture likelihood of firm not able/willing to hold:													
trader	+	0.773	***	(0.281)	0.421	*	(0.229)	-0.127		(0.265)	0.564	*	(0.326)
currentratio	–	0.272	*	(0.150)	0.210	*	(0.128)	0.148		(0.168)	0.138		(0.155)
fcf	–	6.246	**	(3.126)	2.083		(1.948)	8.340	**	(3.331)	1.393		(2.779)
leverage	+	-2.349	**	(1.173)	1.872	**	(0.747)	-1.303		(1.335)	2.307	**	(1.129)
mtb	?	-0.238		(0.176)	-0.089		(0.128)	-0.141		(0.150)	-0.437		(0.282)
prior_otti	+	3.570	***	(0.298)	3.405	***	(0.274)	2.639	***	(0.378)	2.530	***	(0.417)
Variables that capture reporting incentives:													
bath	+	-0.631		(0.447)	0.290		(0.207)	-0.624		(0.493)	0.538		(0.312)
smooth	+	-0.705	*	(0.447)	0.206		(0.193)	-0.420		(0.448)	0.018		(0.400)
neg_spi	+	0.196		(0.447)	0.489	***	(0.184)	0.011		(0.618)	0.760	*	(0.401)
just_meet	–	-0.092		(0.447)	-0.130		(0.241)	0.207		(0.434)	0.033		(0.404)
Constant		-9.516	***	(0.447)	-8.367	***	(0.661)	-10.570	***	(1.227)	-9.322	***	(0.894)
pseudo R-sq		0.323			0.226			0.450			0.357		
Observations		37,090			37,090			19,246			19,246		

This table presents the results of the logit regression examining the determinants of an other-than-temporary impairment (Panel A) and Debt and Equity OTTI (Panel B). Model is run with no fixed effects and standard errors are clustered by firm and period.

Table 6
OTTI Determinants - LOGIT Regression on OTTI Firms

		Sample Period: 2000-2013						Sample Period: 2006-2013					
		Quarterly (1)			Annual (2)			Quarterly (3)			Annual (4)		
VARIABLES	**Sign?**	**Coefficient**		**St.Err**	**Coefficient**		**St.Err.**	**Coefficient**		**St.Err**	**Coefficient**		**St.Err.**
Variables that capture likelihood of having an impaired investment:													
chg_sp500	–	-4.139	***	(1.217)	-2.492	**	(1.233)	-1.423		(1.374)	-1.385	*	(0.834)
lag_invest	+	0.625	***	(0.205)	0.702	***	(0.243)	0.481	*	(0.321)	0.669	***	(0.275)
size	+	0.041		(0.051)	0.033		(0.077)	0.037		(0.066)	0.075		(0.096)
q4	+	1.128	***	(0.189)				0.851	***	(0.220)			
adj_un_loss	+							2.281	***	(0.267)	2.529	***	(0.223)
lag_un_loss	+							0.908	***	(0.294)	0.676	*	(0.295)
lag3_un_loss	+							0.100		(0.197)			
Variables that capture likelihood of firm not able/willing to hold:													
trader	+	0.388	***	(0.143)	0.329	**	(0.159)	0.305		(0.203)	-0.004		(0.146)
currentratio	–	0.132	*	(0.074)	0.057		(0.068)	0.124		(0.093)	0.165	*	(0.092)
fcf	–	3.098	*	(1.855)	0.313		(1.096)	6.272	**	(2.802)	1.538		(1.275)
leverage	+	1.050	**	(0.504)	0.958		(0.686)	1.203	*	(0.712)	1.307	**	(0.848)
mtb	?	-0.239	***	(0.085)	-0.133	**	(0.063)	-0.358	***	(0.138)	-0.161	***	(0.067)
prior_otti	+	1.932	***	(0.205)	1.904	***	(0.255)	1.719	***	(0.293)	1.589	***	(0.326)
Variables that capture reporting incentives:													
bath	+	-0.180		(0.180)	0.288		(0.303)	-0.342		(0.285)	-0.318		(0.518)
smooth	+	-0.091		(0.180)	-0.310	*	(0.176)	-0.277		(0.308)	-0.269		(0.271)
neg_spi	+	0.153		(0.209)	0.011		(0.249)	0.401		(0.339)	-0.003		(0.221)
just_meet	–	-0.129		(0.199)	0.049		(0.225)	0.095		(0.226)	-0.076		(0.254)
Constant		-4.727	***	(0.423)	-2.878	***	(0.496)	-5.730	***	(0.666)	-4.505	***	(0.789)
pseudo R-sq		0.171			0.134			0.305			0.311		
Observations		6,181			1,541			3,544			1,141		

This table presents the results of the logit regression examining the determinants of an other-than-temporary impairment within firms that reported OTTI during our sample period. Model is run with no fixed effects and standard errors are clustered by firm and period.

Table 7
Market Response to OTTI Announcements

		(1)			(2)			(3)			(4)		
		3 Day Abnormal Returns			3 Day Abnormal Returns			3 Day Abnormal Returns			3 Day Abnormal Returns		
VARIABLES		**Coefficient**		**St.Err**	**Coefficient**		**St.Err.**	**Coefficient**		**St.Err**	**Coefficient**		**St.Err.**
forecast_error	+	3.758	***	(0.378)	3.787	***	(0.292)	3.808	***	(0.375)	3.842	***	(0.292)
Other-than-temporary Impairments:													
Total OTTI	?	-0.242		(0.752)	-0.107		(0.572)						
Debt OTTI	?							-3.309	***	(1.182)	-2.774	***	(1.024)
Equity OTTI	?							1.919	**	(0.878)	2.474	***	(0.860)
Uncertain OTTI	?							1.864		(2.561)	2.050		(2.608)
Other Special items:													
Special Items (*spiq*)		-0.004		(0.003)	-0.005		(0.004)	-0.002		(0.002)	-0.002		(0.003)
Industry & Period FE		Yes			No			Yes			No		
Firm FE		No			Yes			No			Yes		
R-sq		0.105			0.111			0.109			0.114		
adj. R-sq		0.095			0.092			0.098			0.095		
Observations		5,888			5,888			5,888			5,888		

This table presents the results of the pooled OLS regression examining the informativeness of an other-than-temporary impairment within firms that reported OTTI during our sample period. Model is run with fixed effects as noted and standard errors are clustered by firm.

Table 8
ASU 2016-1 Guidance and Investment Volatility

Panel A: Firm-level Investment & Volatility Pre/Post ASU 2016-01

		Pre 2014-2017			Post 2018-2019			Post-Pre	
		N	**N !=0**	**Mean**	**N**	**N !=0**	**Mean**	**MeanDiff**	
IVSTQ	mean	635	343	0.0139	635	330	0.0126	-0.0013	
	stdev			0.0083			0.0049	-0.0033	***
IVAOQ	mean	635	54	0.0042	635	51	0.0041	-0.0001	
	stdev			0.0011			0.0006	-0.0004	
XINTQ	mean	602	626	0.0039	602	627	0.0045	0.0006	***
	stdev			0.0010			0.0006	-0.0003	***
NOPIQ	mean	635	612	0.0007	635	610	0.0005	-0.0001	
	stdev			0.0026			0.0029	0.0003	

This table presents the univariate analysis of the change in both the average investment level and volatility of short-term (*ivstq*) and long-term (*ivaoq*) investments, interest expense (*xintq*) and non-operating income (*nopiq*) around the implementation of ASU 2016-01 on December 15, 2017.

Panel B: Market-level Volatility Pre/Post ASU 2016-01

	Pre 2014-2017		Post 2018-2019		Post-Pre
	Mean	**Median**	**Mean**	**Median**	**MeanDiff**
VIX SP500	14.4	13.6	16.0	15.0	1.57
VIX Nasdaq	16.7	15.7	20.0	18.7	3.33

This table presents the change in market-level volatility of both the S&P500 and Nasdaq exchanges around the implementation of ASU 2016-01 on December 15, 2017.

Table 9
Self-Selection Model

Panel A: First-Stage Model – Decision to Hold Investments by Period

		(1) 2000-2013			(2) 2014-2017			(3) 2018-2019		
		Selection (Investment)			Selection (Investment)			Selection (Investment)		
VARIABLES		Coefficient		se	Coefficient		se	Coefficient		se
size	+	0.105	***	(0.012)	0.151	***	(0.0245)	0.177	***	(0.0392)
capex	+	-1.242	***	(0.213)	-2.409	***	(0.611)	-4.725	***	(1.076)
dividends	–	0.002		(0.030)	-0.115	*	(0.067)	-0.018		(0.106)
cash	+	1.740	***	(0.167)	2.336	***	(0.360)	2.139	***	(0.613)
leverage	–	-0.332	***	(0.086)	0.071		(0.141)	0.266		(0.220)
mtb	+	0.113	***	(0.015)	0.062	**	(0.0297)	0.011		(0.0418)
fcf	+	-1.513	***	(0.208)	-1.003	**	(0.496)	-1.669	**	(0.830)
liabilities	–	-0.071	***	(0.026)	0.043		(0.0534)	-0.044		(0.0848)
Constant		-0.579	***	(0.098)	-0.126		(0.193)	-0.073		(0.285)
Observations		10,802			2,549			1,056		
pseudo R-squared		0.091			0.084			0.106		

This table presents the first stage selection model of the decision to hold investment securities during our sample period. The model includes both industry & year fixed effects and standard errors are clustered by firm and period.

Table 9 (continued)
Self-Selection Model

Panel B: Second Stage Model – Likelihood of Reporting OTTI (Annual)

		Second Stage Model		
		Coefficient		St.Err
Variables that capture likelihood of having an impaired investment:				
chg_sp500	–	-0.075	***	(0.0114)
lag_invest	+	0.012	*	(0.0072)
size	+	0.008	***	(0.0020)
Variables that capture likelihood of firm not able/willing to hold:				
trader	+	0.012	**	(0.0049)
currentratio	–	0.007	***	(0.0021)
fcf	–	0.006		(0.0307)
leverage	+	0.013		(0.0137)
mtb	?	-0.001		(0.0022)
prior_otti	+	0.410	***	(0.0120)
Variables that capture reporting incentives:				
bath	+	0.014		(0.0122)
smooth	+	-0.014	**	(0.0058)
neg_spi	+	0.005		(0.0058)
just_meet	–	0.003		(0.0069)
Constant		0.006		(0.0160)
mills		0.008		(0.00835)
Observations		10,802		

This table presents the results of the second-stage model re-examining the determinants of reporting an other-than-temporary impairment. The model is estimated with industry & year fixed effects and standard errors are clustered by firm and year.