Goodwill Impairment Loss: Causes and Consequences

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1. Introduction

In March 2002, media titan, AOL Time Warner Inc. announced a staggering loss of \$54 billion due to impairment in the value of goodwill, including goodwill resulting from the merger of AOL and Time Warner. Other companies, such as DuPont and Lucent Technologies, followed with goodwill impairment losses running into millions of dollars. These losses are a consequence of a recent standard on accounting for goodwill issued by the Financial Accounting Standards Board (FASB). Effective June 30, 2001, the Statement of Financial Accounting Standards (SFAS) No. 142, "Goodwill and Other Intangible Assets," eliminated the long-accepted practice of systematic amortization of goodwill acquired in business combinations. Instead, the standard requires companies to review goodwill for impairment at regular intervals and when circumstances warrant, and to recognize a loss if impairment has occurred. The objective of this paper is three-fold. First, we test whether the announcement of a loss due to goodwill impairment provides new information about the firm to investors and financial analysts. Second, we examine whether and to what extent the market anticipates the fact of the goodwill impairment and its magnitude prior to the company's announcement of the impairment loss. Third, we inquire into the possible causes of goodwill impairment -- whether it arises from overpayment for the target at the time of the original acquisition or is due to events subsequent to the acquisition or both.

The impairment test prescribed by the new standard involves the estimation of the implied fair value of goodwill for each reporting unit of a company by subtracting the fair value of the recognized net assets of the unit from the fair value of the unit as a whole (essentially the fair value of goodwill is measured as a residual). Fair values are estimated using quoted market prices if available or using a present value or other valuation formula. Since the fair value of goodwill is determined at the reporting unit level (usually a level lower than that of the total entity), quoted market prices will not be available unless the reporting unit is a traded subsidiary; thus management in most cases estimates the fair value of each unit using a valuation formula based on their future cash flow projections or based on pricing multiples of comparable traded companies or a combination of these techniques. Even when a quoted market price is available for the reporting unit as a whole, the fair value of most individual net assets is likely to be based on projections of future cash flows from each asset. Therefore, it is reasonable to assume that the magnitude of impairment is based at least partially on management's projections of future cash flows. Hence, it is likely that, in estimating the impairment loss, management may reveal their private information about the firm's future profitability prospects. We hypothesize that the announcement of an impairment loss may reveal management's private information to the public, resulting in a downward revision in the expectations of market participants. Specifically, we first test whether there is a significant negative market reaction to the announcement of a loss due to goodwill impairment. Second, if the estimate of the implied fair value of goodwill reflects management's future projections, we test whether financial analysts revise their short-term and long-term earnings forecasts downward following the announcement of a goodwill impairment loss.

Alternatively, information about the firm's unfavorable future prospects may already be known to market participants via other sources and the loss recognition may not provide any new information. We investigate whether and to what extent the market price already incorporates information about the impairment prior to the announcement of the loss by management. In addition to examining the reaction of market participants at the time of the impairment announcement, we trace the impairment back to the original acquisition of the reporting unit. It is possible that firms with impaired goodwill overpaid for the target company at the time of the original acquisition. Since data identifying the specific target whose goodwill is impaired is not available for more than 80% of our sample firms, we examine whether an impairment firm on average overpaid for acquisitions made during the previous five years. If the market perceived an overpayment, we expect the market reaction to be negative for the parent and positive for the target at the announcement of the original acquisition. We also examine other indicators of potential overpayment, such as the percentage of purchase price paid in excess of the target's book value, whether the purchase consideration was paid in the form of shares, and whether multiple bidders competed for the target, and compare these variables with an industry-matched control sample of acquirers that did not announce goodwill impairment. On the other hand, it is also possible that the impairment of goodwill results not from initial overpayment but from events subsequent to the acquisition (or both factors). A decline in the value of parent stock would be consistent with negative events occurring subsequent to the acquisition that may have led to the goodwill impairment. Thus, we test whether the magnitude of impairment loss can be explained by indicators of initial overpayment and/or the post-acquisition price decline.

Prior studies have generally focused on the value-relevance of losses due to impairment of tangible as well as intangible assets and have examined the contemporaneous association of annual returns with annual earnings (before impairment loss) and impairment loss as reported in companies' 10K filings. Rather than examining contemporaneous associations, this study focuses on the *announcements* of goodwill impairment losses and examines how and when market participants react to the information contained in such announcements. Further, we focus only on (transition) losses relating to impairment of existing goodwill (that is, losses that arise from the initial

application of SFAS 142) which are a consequence of the FASB's mandate and hence our results are not likely to be muddled by the simultaneous effects of asset restructuring or disposition that may have led to goodwill write-offs by companies prior to the issuance of the new standard.

Our results show that on average the market revises its expectations downward on the announcement of a goodwill impairment loss and the downward revision is related to the magnitude of the loss. Similarly, on average, financial analysts revise their short-term and long-term earnings forecasts downward following the announcement of an impairment loss. Further, we find that analysts' forecast revisions are negatively correlated with the magnitude of the impairment loss after controlling for the effect of their most recent forecast error. Thus, our evidence indicates that the announcement of a goodwill impairment loss reveals managers' private information about the future prospects of the firm to market participants.

Further, we observe that impairment firms experience poor return performance over a period of two years prior to the loss announcement. For firms with significant impairment amounts, we find the impairment loss to be negatively correlated with return performance over the prior two years. Thus, while the announcement of the loss did reveal new information relevant to market participants, it appears that for a significant number of firms the impairment in the value of goodwill was anticipated by the market much before its official announcement following SFAS 142. Interestingly, for most firms the negative return performance occurs in year –2 relative to the year of impairment, which coincides with the market collapse in late 2000 continuing into 2001. This suggests that perhaps the sharp market downturn coming right after a prolonged boom may have wiped out a significant portion of the goodwill of these firms. Thus, in interpreting our results, we are more inclined to believe that the impairment itself was a *consequence* of declining prices rather

than the hypothesis that the market anticipated the fact and the magnitude of impairment loss. The fact that companies may have postponed goodwill write-offs until such time as the FASB required them to do so suggests that SFAS 142 was long overdue.

Several interesting observations emerge when we examine whether goodwill impairment was caused by initial overpayment or by subsequent events. First, on average, the market reaction to the original acquisitions made by acquirers in the impairment sample is significantly lower for acquirers and higher for targets relative to that for a control sample of acquisitions. Thus, it appears that, relative to other acquisitions, acquiring shareholders lost while target shareholders gained on average from the acquisitions made by firms in the impairment sample. One could surmise from this result that the market viewed these acquisitions with disfavor and possibly perceived an overpayment for the target. Second, our results indicate that, relative to the control sample, firms in the impairment sample may have overpaid for prior acquisitions on average, when overpayment is measured as excess purchase consideration over the target's book value.¹ Third, we find that the magnitude of impairment loss is positively correlated with some indicators of overpayment (excess purchase price over the target's book value and stock consideration) and negatively correlated with post-acquisition return performance of the impairment firm. Thus, it is likely that the value of goodwill of these firms may have been partly impaired at the outset due to initial overpayment for their acquisitions and was further depleted by the economic recession and market downturn that followed these acquisitions. It is interesting to note that even during times of market euphoria, the market seemed to perceive the original acquisitions as poor bargains for the acquirers.

¹However, contrary to our expectation, a higher percentage of firms in the control sample used stock as a component of the purchase consideration compared to firms in the impairment sample. Thus, not all proxies of overpayment obtain consistent results.

Overall, our evidence indicates that companies were perhaps aware of the impairment in the value of their goodwill much before the issuance of SFAS 142. However, in the absence of specific guidance to that effect, companies chose not to recognize an impairment loss. Although it is likely that investors incorporated the effect of the loss in their valuations, the official loss recognition did convey new information to the market. While in this regard SFAS 142 was effective, if goodwill impairments in the future were to arise from temporary market decline, the value of this information to investors may be suspect. Further, such impairments may lead to misstated book values of goodwill in future years when the market swings back, since companies are expressly prohibited from restoring a previously recognized impairment loss.

The rest of the paper is organized as follows. Section 2 describes our hypotheses. Section 3 discusses the data and research design. Empirical results are reported in Section 4, followed by concluding remarks in Section 5.

2. Hypotheses Development

SFAS 142 establishes a new accounting standard for goodwill acquired in business combinations. Prior to the issuance of the standard, the generally accepted practice amortized goodwill usually on a straight-line basis over its useful life subject to a maximum of 40 years. During its deliberations of the standard, the FASB argued that goodwill is not a wasting asset and hence should not be amortized. Instead, the new standard requires goodwill to be tested for impairment on an annual basis and between annual tests if events or change in circumstances suggest that the carrying amount of goodwill may not be recoverable. The impairment test must use a fair value approach and must be performed at the reporting unit level, where a reporting unit is defined as an operating segment or one level below an operating segment (the reporting unit must constitute a business for which discrete financial information is available and whose operating results are regularly reviewed by segment management).

The first step of the goodwill impairment test compares the fair value of a reporting unit with its carrying amount, including goodwill. If the fair value of the reporting unit exceeds its carrying amount, its goodwill is considered not impaired and the second step is not performed. If the fair value is less than the carrying amount, then the impairment loss is determined in the second step by comparing the *implied* fair value of goodwill of the reporting unit with its carrying amount. The implied fair value of goodwill is determined by subtracting the fair value of the recognized net assets of the reporting unit from the fair value of the reporting unit, i.e. the fair value of goodwill is measured as a residual. In the absence of a quoted market price for the reporting unit, the standard recommends that the fair value be based on the best available information using present value or other valuation techniques.

The provisions of SFAS 142 are applicable in fiscal years beginning after December 15, 2001. The transition provisions of the standard require companies to recognize a loss by the end of the year of initial application of the standard if the previously recognized (existing) goodwill is found to be impaired. The impairment loss is to be reported in the income statement "below-the-line" as a change in accounting principle.

Since January 2002, a growing number of companies have announced losses due to impairment of previously recognized (existing) goodwill running into millions of dollars. Since these announcements appear soon after the issuance of the new standard, it may suggest that companies were already aware of the impairment in goodwill, but did not recognize a loss in the

absence of a FASB directive. On the other hand, it is possible that, prior to the new standard, goodwill was not found to be impaired under the existing rules.² Regardless of whether companies found their goodwill to be unimpaired under the earlier rules or did not report an impairment in the absence of a specific directive, the announcement of an impairment loss as a consequence of the new standard is likely to convey new information to market participants. We argue that, since the impairment loss is based at least partially on management's projections of future cash flows of the reporting unit, the announcement of an impairment loss must reveal management's private information to the public. Thus, we expect market participants to revise their expectations of future earnings and cash flows downward on the announcement of a loss due to goodwill impairment.

Previous studies on asset impairments in general find that asset write-downs are value relevant. For example, Alciatore, Easton, and Spear (2000) find that write-downs of oil and gas assets (during the period 1984-87) are significantly correlated with contemporaneous quarterly returns as well as lagged returns, suggesting that much of the market price adjustment due to the decline in asset values occurs at least one quarter earlier. Some previous studies hypothesized that prior to 1995 managers used their discretion about the amount and timing of write-offs to manipulate earnings, since little authoritative guidance on accounting for most types of asset impairments was available at that time (other than for inventory and oil and gas assets).³ For example, for a sample of asset write-offs occurring during the period 1989-92, Francis, Hanna, and Vincent (1996) find that

²Prior to SFAS 142, goodwill write-offs occurred in connection with asset restructuring, or the imminent disposal of a unit, or pursuant to SFAS 121 "Accounting for the Impairment of Long-Lived Assets" (effective March 1995). The method of computing the loss due to goodwill impairment was not specified, but presumably companies estimated the fair value of goodwill as a residual similar to SFAS 142. However, there are significant differences in the criteria for estimation of impairment losses under SFAS 121. For example, the fair value of an asset is determined using the *undiscounted* present value of future cash flows from the asset and impairment is determined for the aggregate asset rather than at the disaggregated reporting unit level as under SFAS 142.

³These studies include Francis, Hanna, and Vincent (1996), Elliott and Hanna (1996), and Rees, Gill, and Gore (1996).

write-offs are determined by both factors, manipulation and impairment; however, they find that incentives to manipulate earnings play a greater role in write-offs of goodwill and restructuring charges. These authors also find significant market reaction to write-off announcements, but the reaction is not negative with respect to write-offs of all asset categories; the market reacts positively when the write-off is in connection with a restructuring. In relation to write-offs of goodwill, Henning and Stock (1997) find that write-offs related to intangible assets valued by the market are associated with both contemporaneous and prior stock price decreases, and the correlation is driven by firms that perform better than their industry.

Rather than examining the contemporaneous association between annual returns and impairment losses, in this paper we examine how investors and financial analysts react to the information contained in *announcements* of goodwill impairment losses. We provide a cleaner test by focusing only on transition impairment losses, that is, losses relating to impairment of existing goodwill that are a consequence of the FASB's mandate. As such, we abstract from the effects of asset restructuring or disposition or potential earnings management that may be tied to goodwill write-offs prior to SFAS 142.

2.1 Market reaction to announcement of goodwill impairment loss

To test whether the market reacts negatively to the announcement of a goodwill impairment loss, we calculate cumulative abnormal returns over a three-day window centered on the announcement date. If the impairment loss provides new information to the market, we expect on average significantly negative announcement-period abnormal returns for our sample. Additionally, to test whether the market reaction is related to the magnitude of the impairment loss, we estimate a regression of announcement-period abnormal returns on goodwill impairment loss. A significant negative coefficient on impairment loss will be consistent with the market reacting to the magnitude of the loss. Since roughly 95% of all announcements of impairment losses are made simultaneously with annual or quarterly earnings announcements, the announcement-period market reaction would be partly due to the earnings news. Hence, we include unexpected earnings (excluding the impairment loss) as an additional independent variable in the regression. Thus,

H1(a): On average, the market reaction to the announcement of a goodwill impairment loss is negative and significant after controlling for news in the simultaneous earnings announcement.

2.2 Effect of goodwill impairment loss on analysts' earnings forecast revisions

If the announcement of a goodwill impairment loss reveals management's private information about the future prospects of the firm, we expect financial analysts to revise their earnings forecasts downward. We calculate earnings forecast revisions made by analysts immediately following the announcement of an impairment loss and test whether these revisions adjust analysts' forecasts of future earnings downward. Further, we test whether the slope coefficient from a regression of analysts' forecast revisions on goodwill impairment loss is negative and significant, indicating that the magnitude of the loss provides new information to analysts that leads to a revision in their future earnings expectations. We also include the analyst forecast error associated with the latest earnings announcement as an additional independent variable, since prior research has shown that analysts on average revise their forecasts of future periods in the direction indicated by their most recent forecast error (see Ali, Klein, and Rosenfeld, 1992). Thus,

H1(b): On average, revisions in analysts' forecasts of future earnings are negatively correlated with

goodwill impairment loss after controlling for the most recent forecast error.

Interestingly, we observe that several companies explicitly announce that they have completed the impairment test and find that the value of their goodwill is unimpaired. We replicate the above tests for the sample of "no-impairment" firms and examine whether the announcement of no-impairment conveys any news to market participants.

2.3 Anticipation of goodwill impairment by the market

Impairment of existing goodwill is likely to have occurred prior to its actual announcement by the company, either as a result of initial overpayment or due to subsequent poor performance of the reporting unit. Thus, it is possible that the market was already aware of the impairment and impounded its effect in price prior to its announcement by the company. We examine whether the impairment loss is correlated with the return performance of the company over previous quarters. Thus,

H2: On average, the magnitude of goodwill impairment loss is negatively correlated with returns over one to four (eight) quarters preceding the loss announcement by the company.

Results consistent with H2 would suggest that information about the impairment was at least partially incorporated in price prior to the announcement. If all of the information is not fully incorporated in the pre-announcement price, we should still observe a significant market reaction at the time of the impairment announcement. As discussed earlier, it is likely that the estimation of the impairment loss under the new rules may result in the revelation of management's private information about future cash flows to market participants. As such, we may observe both preannouncement and announcement effects of the impairment on abnormal returns. While the estimation of the relation between goodwill impairment loss and prior return performance poses no problems, the interpretation of results of H2 is not straightforward. A negative coefficient estimate on goodwill impairment loss may be interpreted as the market anticipating the impairment of goodwill <u>or</u> the impairment itself being a *consequence* of declining prices. The latter explanation could be more likely for firms with a single or few reporting units, where the fair value of the firm reflects the fair value of the reporting unit(s). These firms may have in fact determined the impairment loss based on the decline in their stock price. Thus, we interpret results of H2 with caution, since the causality in relation to prior return performance and impairment loss is unclear.

2.4 Causes of goodwill impairment loss

A goodwill impairment loss may be a consequence of overpayment for goodwill at the time of the original acquisition of the target company and/or may result from subsequent events affecting the performance of the reporting unit. We examine whether and to what extent the impairment loss is related to proxies of overpayment for the target measured at the time of the original acquisition. Prior research, both theoretical and empirical, suggests that acquirers may often overpay for the target. These papers argue that overpayment may result (i) from agency conflicts in mergers and tender offers -- managers may act in their own self interest at the expense of shareholders in order to remain entrenched or to diversify the risk on their human capital, for example, by pursuing unrelated diversification (Morck, Shleifer, and Vishny, 1990), or (ii) because of hubris -- managers may misestimate target value or overestimate their own ability to manage the target. Roll (1986) finds that acquirers overpay for targets, on average. Berkovitch and Narayanan (1993) find evidence supporting the agency conflict and the hubris hypotheses. Henning, Lewis, and Shaw (2000) show that the estimated overpayment component of goodwill is negatively related to the acquirer's market value after the acquisition implying that the acquirer initially overpaid for the target.

We first test whether the market reaction at the time of the original acquisition indicates that the acquirer overpaid for the target in the market's perception. If the market believed that the acquirer overpaid for the target, we expect the market reaction to the acquisition announcement to be negative for the acquirer and positive for the target company. Moreover, we expect the market reaction to be significantly lower for the parent and higher for the target relative to an industrymatched control sample of firms that acquired a target in the same year. Second, we expect some indicators of overpayment for the original acquisition to be significantly higher for the impairment sample relative to the control sample. And third, we expect the magnitude of impairment loss to be positively correlated with indicators of overpayment and negatively correlated with the performance of the acquirer subsequent to the acquisition.

Since overpayment (if any) is not directly observable, we use proxies to capture the probability of overpayment. Specifically, we use (i) percentage of purchase price paid in excess of the pre-acquisition book value of the target, (ii) percentage purchase premium paid relative to the pre-acquisition market value of the target, (iii) whether the purchase price in part or full was paid in the form of shares, and (iv) whether multiple bidders competed for the target firm as indicators of potential overpayment for the original acquisition of the target. In relation to (i) and (ii), we hypothesize that it is more likely that the parent overpaid for the target if the acquisition price significantly exceeds the pre-acquisition book value or market value of the target. It is of course possible that the excess was paid for correctly valued intangibles or goodwill of the target; however,

a significantly high amount of excess payment may signal potential overpayment. In relation to (iii), we hypothesize that the probability of overpayment is higher, if part of the purchase consideration is paid in the form of parent stock. In support of this hypothesis, Myers and Majluf (1984) find that a bidding firm will offer to pay in stock when its managers believe their firm to be overvalued.⁴ If overvalued stock is regarded as cheap currency, it is possible that acquirers when using this currency as part of the purchase consideration may overpay for the target. In relation to (iv), we argue that acquiring firms may overbid when there are multiple bidders for the target. This is consistent with Bradley, Desai, and Kim (1988) who document that bidders do worse when they are involved in an open contest for the target. Thus,

H3(a): On average, the market reaction to the announcement of the original acquisition of the target made by firms in the impairment sample is negative and significant for the acquirer and positive and significant for the target company.

H3(b): On average, the market reaction to the announcement of the original acquisition made by firms in the impairment sample is lower for the acquirer and higher for the target relative to an industry-matched control sample of acquirers.

H3(c): Relative to an industry-matched control sample of acquirers, acquirers in the impairment sample overpaid for the target at the time of the original acquisition as indicated by various proxies of overpayment.

H3(d): On average, impairment loss is positively correlated with indicators of overpayment for the original acquisition and negatively correlated with the post-acquisition performance of the acquirer.

⁴This is consistent with the findings of Erickson and Wang (1999) that bidding firms attempt to manipulate their stock price upward before mergers.

3. Data, Sample Selection, and Research Design

To identify firms that announced goodwill impairment losses we search the business news section of the *Lexis-Nexis* database using "goodwill impairment", "impairment of goodwill", "goodwill write off", "SFAS 142" and other variations of these key words. *Lexis-Nexis* is a comprehensive database that consolidates announcements appearing in various business newspapers as well as on-line news retrieval services. As stated earlier, the transition provisions of SFAS 142 are applicable in fiscal years beginning after December 15, 2001. Hence, our search includes a two-year period starting January 2002 and ending December 2003, which includes the first fiscal year of application of the standard for all companies. Our final sample is restricted to firms with data on *Compustat* and CRSP databases for tests of market reactions, and in addition *I/B/E/S* database for tests based on analysts' forecasts.

Currently, we have hand-collected data from January 2002 to March 2003 for 352 announcements of transition goodwill impairment losses. Our sample includes firms that announce a transition goodwill impairment loss for the first time after January 2002. Subsequent announcements of revisions made to earlier announcements are not included in our sample. We also exclude 39 firms that announce a loss *range* rather than a specific dollar amount.⁵ Announcements of a specific dollar amount subsequent to announcements of a range are also excluded because it is unclear which announcement the market would have reacted to. After applying these filters, the number of firms announcing (transition) goodwill impairment losses equals 15, 101, 99, 83, and 54

⁵We find considerable variation in the range of loss announced by companies, with a few small ranges and a few ranges expressed from zero to millions of dollars. We exclude all announcements of ranges because we believe that midpoints of wide ranges are not meaningful and imposing inclusion/exclusion rules would be arbitrary.

in the first, second, third, fourth quarters of 2002, and first quarter of 2003, respectively. Concentrations of announcements occur in the two months following the end of each quarter. Roughly 95% of firms simultaneously announce goodwill impairment losses and quarterly/annual earnings during the same three-day window. Note that a number of firms have announced goodwill impairment losses much before they are required to recognize them by SFAS 142 (which is by the end of the fiscal <u>year</u> beginning after December 15, 2001).

We use the Securities Data Corporation (SDC) database to obtain information on acquisitions. First, we obtain data on all acquisitions made by each of our sample firms in the previous five years (1997 to 2001) and examine if the firm overpaid for its acquisitions on average. Second, we examine the goodwill impairment footnote included in the 10K reports of our sample firms to identify the specific acquisition to which the goodwill impairment relates. Most footnote disclosures include the details of impairment loss by reporting unit (as required by the new standard) and the majority of reporting units relate to business segments of the company. Thus, in general these footnote disclosures are not very useful in pinpointing the specific acquisition to which the impairment relates. We are able to find specific target names for about 20% of our sample from footnote disclosures. Although the sample size is relatively small, we believe our tests of the initial overpayment hypothesis will be more powerful for this sample that directly traces the specific target acquisition to which the impairment relates.

To test whether the market reacts negatively to the announcement of goodwill impairment losses, we estimate the following cross-sectional regression:

$$AR_{i} = \alpha_{0} + \alpha_{1}ILOSS_{i} + \alpha_{2}UE_{i} + \varepsilon_{i}$$
(1)

where

 $AR_i = 3$ -day (-1, 0, +1) abnormal returns of firm *i* centered on the loss announcement date,

- ILOSS_i = Per share (after-tax) transition goodwill impairment loss of firm *i* announced on date *t*, scaled by the closing price on date *t*-2, P_{t-2} , and
- UE_i = Unexpected earnings per share of firm *i* for the latest fiscal quarter whose earnings announcement date precedes or coincides with the loss announcement date, scaled by P_{t-2}. Abnormal returns are calculated using the (adjusted) market model. The estimating regression is run with daily returns of the firm and the equally weighted market index over a period of 120 days ending on day –2 relative to the loss announcement date.⁶ We require a minimum of 50 days of returns data to obtain reasonably accurate estimates of β. We use the aggregated coefficient method proposed by Dimson (1979) and modified by Fowler and Rorke (1983) to control for infrequent trading and bid-ask bounce. Unexpected earnings per share (EPS) is calculated as the *I/B/E/S* actual EPS minus the consensus analysts' EPS forecast, where the consensus is constructed over a period of 60 days preceding the earnings announcement date.

In regression (1), α_0 is the intercept, α_1 is the coefficient estimating the impact of impairment loss on the 3-day abnormal return, α_2 is the coefficient estimating the response of the market to earnings surprise, and ε_i is the error term. We expect α_1 to be negative and significant (since the impairment loss is expressed as a positive number) if the market adjusts its expectations of the firm's future prospects downward upon the announcement of the impairment loss. α_2 is expected to be positive and significant, consistent with numerous prior studies that show that the earnings response coefficient is positive.

To test whether financial analysts adjust their future EPS forecasts downward upon the

⁶Using the value-weighted instead of the equally weighted index obtains substantially similar results.

announcement of a goodwill impairment loss, we estimate the cross-sectional regression

$$REV_{i} = \beta_{0} + \beta_{1}ILOSS_{i} + \beta_{2}FE_{i} + \omega_{i}$$
⁽²⁾

where

- REV_i = Forecast revision of subsequent quarters' EPS of firm *i* made within a period of 60 days following the loss announcement date, scaled by P_{t-2} ,
- $FE_i = EPS$ forecast error of firm *i* for the latest fiscal quarter whose earnings announcement date precedes or coincides with the loss announcement date, scaled by P_{t-2} .

Forecast revision equals consensus analysts' forecast over a period of 60 days following the loss announcement date minus the consensus forecast of the same quarter over a period of 60 days preceding the loss announcement date. EPS forecast error is calculated as *I/B/E/S* actual EPS minus the consensus analysts' forecast, where the consensus is constructed over a period of 60 days preceding the earnings announcement date. We expect β_1 to be negative and significant if analysts revise their EPS forecasts of future quarters downward after the announcement of the impairment loss. Consistent with prior research, we expect β_2 to be positive and significant indicating that analysts revise their forecasts of subsequent quarters in the same direction as the forecast error associated with the latest earnings announcement.

We test whether the market anticipated the impairment in the value of goodwill prior to the official announcement by the company. We estimate the following regression:

$$R_{it-\tau,t-1} = \gamma_0 + \gamma_1 ILOSS_{it} + \gamma_2 E_{it-\tau,t-1} + u_{it-\tau,t-1} \qquad \tau = 4, 8$$
(3)

where

 $R_{it-\tau,t-1} = Returns of firm i over quarters (t-\tau) to (t-1) relative to the announcement quarter t, \tau = 4, 8,$ ILOSS_{it} = Per share (after-tax) transition goodwill impairment loss of firm *i* announced in quarter *t*, scaled by price at the beginning of quarter t- τ ,

 $E_{it-\tau,t-1} =$ Sum of EPS of firm *i* over quarters (*t*- τ) to (*t*-1) relative to the announcement quarter *t*, scaled by price at the beginning of quarter *t*- τ .

If the market was aware of the information about the goodwill impairment prior to its announcement, we expect the coefficient on impairment loss, γ_1 , to be negative. γ_2 , the coefficient on contemporaneous scaled earnings is expected to be positive, consistent with the findings of prior research on the returns-earnings association. As stated in the previous section, a negative γ_1 is also consistent with managers partially basing the estimation of impairment loss on the company's return performance (especially for impairment companies with one or few reporting units). Hence, given that the direction of the causality is unclear, we interpret our results with caution.

4. Empirical Results

Table 1 reports descriptive statistics for our sample of 352 firms that announced a transition goodwill impairment loss between January 2002 and March 2003. The mean (median) after-tax impairment loss is \$290.6 (\$24.5) million with a maximum loss of \$54 billion. The significantly higher mean relative to the median is consistent with a few firms with very high amounts of impairment losses; roughly 22% of sample firms announce an impairment loss exceeding \$100 million. For the sample of 315 firms with *Compustat* and CRSP data, the mean (median) per share goodwill impairment loss as a percentage of price is 66.7% (12.1%). The mean (median) EPS for the announcement quarter is 0.04 (0.05). While the mean and median EPS and change in EPS of the announcement quarter are positive, roughly 36% of sample firms report negative EPS in the

announcement quarter.⁷ For the sample of 152 firms with data on *I/B/E/S*, the mean unexpected earnings relative to the consensus analysts' forecast (scaled by P_{t-2}) is a small negative (-0.05%), while the median is a small positive (0.03%).

Prior to the announcement, the mean (median) market capitalization of the full sample is \$4,042.1 (\$272.6) million, and the mean (median) total assets is \$7,415.9 (\$719.0) million. Our sample firms are larger than the average size of the *Compustat* population of firms at the beginning of 2002 (*Compustat*: \$2,390.2, mean market capitalization and \$5,350.3, mean total assets). At the beginning of the announcement quarter, the median market-to-book ratio of our sample firms is 1.25, which is lower than the median of 1.45 for the *Compustat* population at the beginning of 2002. This is consistent with overstated book values of impairment firms relative to others.

Table 2 presents the distribution of firms announcing goodwill impairment losses by industry groups. Firms are evenly distributed across industries, except for a higher concentration of firms in the machinery and electronics (16.7%) and business services (13.0%) groups. The median impairment loss is more or less consistent across industries with the exception of firms in the oil and gas and construction industry and utilities for which the loss is significantly higher.

4.1 Market reaction to announcement of goodwill impairment loss

Panel A of Table 3 reports the mean 3-day abnormal returns on the announcement of

⁷Only four of the sample firms (1.3%) report negative book value of common equity at the beginning of the announcement quarter. However, a significant number of sample firms (42.3%) have book value in excess of market value.

goodwill impairment loss.⁸ For the full sample, the mean 3-day abnormal return is negative (-0.48%) and significant at the 5% level. Since both the impairment loss and earnings are announced in the same window for most of our sample firms, the effect of a positive earnings surprise could swamp the negative effect of the impairment loss. Hence, we partition the sample by the sign of unexpected earnings and examine the return performance separately for three groups: positive unexpected earnings, negative unexpected earnings, and firms that did not announce earnings in the loss announcement window. Because we lose more than half the sample firms due to the requirement of *I/B/E/S* data to calculate unexpected earnings, we also report results with seasonal earnings changes as a measure of unexpected earnings. From panel A, we find that, for firms with positive earnings change (relative to the same quarter of the previous year), the mean 3-day abnormal return is positive but insignificant. More importantly, the mean 3-day abnormal return for firms that announced negative earnings change is negative (-1.18%) and significant. When we use the I/B/E/S sample, the mean abnormal return for all firms is negative (-1.43%) but insignificant. For firms with positive unexpected earnings, the mean 3-day abnormal return is insignificant, while for firms with negative unexpected earnings the 3-day abnormal return is a high negative (-5.04%) and significant.

While overall the market adjusts its valuation downward over the event window, the univariate analysis does not enable us to clearly separate the effect of earnings surprise from that of the impairment loss on the market's downward revision. Thus, we perform a multivariate analysis

⁸For all market-based tests, we exclude 7 firms that announced news other than quarterly/annual earnings or goodwill impairment during the 3-day loss announcement window (for example, divestiture, management turnover, stock buyback, stock upgrade, reverse stock split), since these news announcements could have a confounding effect on our results.

that examines the effect of the impairment loss on abnormal returns, after controlling for news in the simultaneous earnings announcement. Table 3, panel B, reports results of the cross-sectional regression (1) of abnormal announcement returns on percentage impairment loss and scaled unexpected earnings for (i) the full sample, and (ii) the *I/B/E/S* sample. We recognize that analysts' forecast errors are a better measure of unexpected earnings than seasonal changes in earnings. Although our main focus is on the results using analysts' forecast errors as unexpected earnings, we also report results using seasonal earnings changes as unexpected earnings because they cover a larger sample.

In the regression using the full sample, we obtain an R^2 of 5.2%. Consistent with hypothesis H1(a), the estimated coefficient on impairment loss is negative (-0.0128) and significant (at the 10% level) indicating that the market reaction is proportionate to the magnitude of the loss. The estimated coefficient on unexpected earnings (seasonal earnings changes) is positive and significant as expected.⁹

In the regression using the I/B/E/S sample, we obtain an R² of 17.6%. The estimated coefficient on impairment loss is negative (-0.0913) and significant at the 1% level. The coefficient estimate on unexpected earnings is positive and significant, consistent with prior research. (We do not observe significant outliers in this sub-sample.) Overall, our results show that the market revises its expectations of the firm's future prospects downward upon the announcement of a goodwill impairment loss. This implies that the announcement of a goodwill impairment loss conveys

⁹We observe a few outlying observations with extremely high values of percentage impairment loss. The results reported here are after winsorizing 5 observations; impairment loss in excess of 5 times the market capitalization of the firm is set to 5 times. When the original values for these outlying observations are retained, we obtain a substantially *higher* R^2 and coefficient estimates that are significant at the 1% level. We do not report results including outliers due to the concern regarding their robustness.

negative news to the market that was not publicly available.

4.2 Effect of goodwill impairment loss on analysts' earnings forecast revisions

Table 4 reports the means of consensus earnings forecast revisions made by analysts for subsequent quarters, where the consensus is constructed over a period of 60 days immediately following the announcement of the impairment loss. For 85.5% of our sample firms, we find that analysts revise forecasts of subsequent periods within a period of 60 days following the loss announcement date. If the announcement of goodwill impairment loss conveys negative news about the firm, we expect financial analysts to revise their forecasts of subsequent periods downward. 56.6% of forecast revisions of all subsequent quarters are downward revisions. The percentage of revisions of the immediately succeeding quarter's forecast and the one-year ahead forecast that are downward are 69.2% and 59.5%, respectively.

Since the forecast revision may reflect the news in the impairment as well as the earnings announcement, we partition the sample into firms with positive forecast error (unexpected earnings), negative forecast error, and no earnings announcement in the event window of the loss announcement ("No Overlap"). In panel A, we report results of revisions in (i) forecasts of all subsequent quarters, (ii) forecast of the immediately succeeding quarter, and (iii) one-year ahead forecast made within the 60-day post-loss period.¹⁰ For all forecast horizons, we find that the mean consensus forecast revision for all firms is negative and significant at the 1% level.¹¹ Also, the mean

¹⁰To ensure that our results are not affected by a few outliers, we exclude firms with forecast revisions in the upper or lower 1% of observations.

¹¹Note that the elimination of annual goodwill amortization under SFAS 142 would lead to an upward revision in analysts' forecasts (all else equal). Thus, the downward revision reflects the *net* effect of goodwill impairment less amortization.

revisions in forecasts of all subsequent quarters and of the next quarter are negative and significant for firms with positive as well as negative forecast errors, with the downward revision being slightly higher for firms with negative forecast errors. The mean downward revision in one-year ahead forecasts is significant for the sample with negative forecast errors, but insignificant for the sample with positive forecast errors.

In panel B, Table 4, we report the results of regression (2) that analyzes the effect of impairment loss on analysts' forecast revisions of subsequent periods after controlling for the latest forecast error. For the sample of revisions to forecasts of all subsequent quarters, the regression R^2 is 2.4%. Consistent with H1(b), the estimated coefficient on impairment loss is negative (-0.0024) and significant at the 5% level. The coefficient estimate on forecast error is positive and significant, as expected. The results are substantially similar for the sample of revisions to the forecast of only the succeeding quarter. The results for the sample of revisions to one-year ahead forecasts are stronger, with an R^2 of 29.6% and a negative estimated coefficient on impairment loss (-0.0151) that is significant at the 1% level.¹² Taken together, our results suggest that analysts revise their short-term and long-term forecasts downward upon the announcement of a goodwill impairment loss, and the downward revision is related to the magnitude of the loss.

To summarize, our results are consistent with our hypothesis that the announcement of a goodwill impairment loss reveals management's private information to the public, resulting in a downward revision in the expectations of market participants.

¹²We find that analysts also revise their long-term growth rate forecasts downward following the announcement of an impairment loss (mean revision of -1.8%). Interestingly, we find that every single long-term growth forecast that is revised is revised downward. However, the mean revision is not significantly different from zero and the R² and coefficient estimates from regression (2) are insignificant (not tabulated). The insignificant results could be explained by the fact that we have data on long-term growth rate forecasts for only 15% of sample firms.

4.3 Anticipation of goodwill impairment by the market

Panel A of Table 5 reports negative mean returns (-4.1%) of the impairment firms over a period of four quarters prior to the announcement quarter.¹³ The negative mean returns over a period of eight quarters prior to the announcement quarter are considerably higher (-23.1%) and significant. Results based on market-adjusted returns are substantially the same as those based on raw returns. Thus, it appears that on average the impairment firms experience poor return performance over a prolonged period prior to the announcement of the loss. However, a large portion of the price decline occurs in quarters 5 to 8 prior to the announcement quarter, which period, for most of the sample firms, coincides with the dramatic market downturn beginning in the last quarter of 2000.

Panel B of Table 5 reports the results of regression (3) of returns of prior quarters on earnings of prior quarters and the impairment loss. If the market anticipated the impairment in the value of goodwill for these firms, we expect a negative relation between prior returns and impairment loss. For the regression using returns of the prior four quarters as the dependent variable, we find that the coefficient estimate on impairment loss is insignificant. When we use returns of the prior eight quarters as the dependent variable, the coefficient estimate on impairment loss is negative as expected but only marginally significant (10% level). It is possible that the market did not anticipate the impairment in the value of goodwill, when the impairment magnitude is small. Therefore, we estimate the regressions using observations with significant impairment amounts (>5% of market value). Consistent with our hypothesis H2, we obtain a negative and significant coefficient estimate on impairment loss (-0.1625) when returns over the prior eight quarters are used as the dependent variable. Thus, it appears that, prior to the announcement, the market incorporated the information

in the impairment loss only when the magnitude of the loss was substantial; moreover, the effect of the impairment was captured in returns over a period of at least two years prior to the announcement of the loss. While at the outset the causality relating to whether the market anticipated the impairment or whether managers based their determination of impairment on market performance was unclear, our results lead us to believe that in large part the impairment was a consequence of the dramatic market downturn during late 2000 and 2001. In view of our findings, it seems likely that the goodwill of these firms was found to be impaired prior to SFAS 142, but in the absence of specific guidance to that effect companies chose not to recognize an impairment loss.

4.4 Causes of goodwill impairment loss

Results of our hypothesis H3 are presented in Tables 6 and 7. Using the SDC database, we obtain data on 1924 acquisitions made during 1997-2001 by 286 acquirers whose goodwill was subsequently impaired under SFAS 142. The final sample (of 1924 acquisitions) is obtained after excluding acquisitions (i) where the acquirer used the pooling-of-interests method of accounting, or (ii) where the acquirer did not own more than 50% of the target after the acquisition.

4.4.1 Return performance of acquirers and targets on announcement of original acquisition

In panel A of Table 6, we report 3-day abnormal returns of acquirers and targets earned on the announcement of the acquisition.¹³ While *CRSP* data is available for most of the acquirers (1,430 observations for 264 acquirers), very few targets are public companies with available price data (129 observations). As stated in H3(a), if the market perceived that acquirers in the impairment sample overpaid for the target, we expect to observe a negative market reaction for the acquiring firm and a positive market reaction for the target firm on the announcement of the original acquisition.

¹³Returns greater than 100% and penny stocks are excluded from the sample for the purpose of these tests.

Contrary to expectation, we obtain insignificant mean (0.21%) and median (-0.07%) 3-day announcement-period abnormal returns for acquirers in the impairment sample. On the other hand, consistent with H3(a), the mean and median abnormal returns of the target firms in the impairment sample are strongly positive and significant (23.9% and 18.6%, respectively).¹⁴

Each acquisition made by an impairment firm in a given year is matched with all acquisitions made in the same year by firms in the same 2-digit SIC code as the impairment firm. Applying the sample selection criteria used for the impairment sample (i.e. no pooling accounting, etc.), we use the SDC database to obtain a control sample of 12,312 acquisitions made by 3,874 acquirers during 1997-2001 with data on CRSP. Again, very few targets are public companies with available price data (1,021 observations). As stated in H3(b), we expect abnormal announcement returns for acquisitions made by firms in the impairment sample to be significantly lower for acquirers and higher for targets relative to firms in the control sample.

From panel A of Table 6, acquirers in the control sample earn significant positive mean and median 3-day abnormal returns on the acquisition announcement (0.75% and 0.07%, respectively). Similarly, target firms in the control sample earn high positive abnormal returns (mean: 20.0% and median: 15.4%). Comparing the abnormal return performance of acquirers and targets in the impairment sample versus the control sample provides some interesting results. Consistent with H3(b), we find that acquirers in the control sample earn significantly higher positive returns relative to acquirers in the impairment sample. Also consistent with H3(b), target firms in the control sample earn significantly lower positive abnormal returns relative to target firms in the impairment sample. Thus, it appears that the market reacts to the original acquisition announcement made by

¹⁴These results are consistent with what is documented in the finance literature on market reaction to acquisition announcements.

impairment firms as if it perceives that, relative to acquirers in the control sample, acquirers in the impairment sample overpaid for the target firm.

4.4.2 Indicators of overpayment for original acquisition: Impairment versus Control samples

Imposing the SDC data requirements significantly reduces the sample size to 90 acquirers and 165 acquisitions, approximating 1.83 acquisitions per acquirer on average over the five-year period 1997-2001. Similarly, the size of the control sample reduces to 974 acquirers and 1,340 acquisitions, which averages to 1.38 acquisitions per acquirer. Note that most observations on the SDC database have dates of acquisition and identified target company names available; however, the sample size shrinks drastically when other acquisition related data is required.

In panel B, Table 6, we compare indicators of overpayment at the time of the original acquisition made by acquirers in the impairment and control samples. If acquirers that later impaired their goodwill overpaid for the original acquisition of the target, then consistent with H3(c) we expect these indicators of overpayment to be significantly higher than those for acquirers in the control sample. We average observations for each acquirer and use means per acquirer for all our analyses.

For the impairment sample, acquirers paid a mean (median) purchase price 3.2 (1.8) times in excess of the target's book value (Excess). In contrast, acquirers in the control sample paid 2.5 times (median 1.1 times) in excess of the target's book value, significantly lower than that paid by acquirers in the impairment sample. For each target, stock consideration (Stock) is an indicator variable that takes on a value of one if all or part of the purchase consideration was in the form of stock, and zero otherwise. Contrary to expectation, we find that a significantly higher percentage of acquisitions in the control sample had a stock component in their purchase consideration (37.3%)

relative to acquisitions made by impairment firms (24.9%). For each target, the variable #Bids equals one if multiple bidders competed for the same target, and zero otherwise. While the mean #Bids is higher for the control sample relative to the impairment sample, the difference is insignificant. (Note that a negligible number of firms had multiple bids in both samples, which may explain the lack of power of this variable.) The purchase premium relative to target price one week prior to the announcement of the acquisition is not significantly different for the 2 samples.

From panel C of Table 6, the results of a logistic regression (where the dependent variable takes on a value of one if the acquirer belongs to the impairment sample, and zero otherwise), indicates that a higher magnitude of excess payment over the target's book value increases the probability of subsequent impairment, while the use of stock as part of the purchase consideration decreases it. While our indicators of overpayment have measurement error, we believe that excess payment over book value is perhaps a more reasonable proxy relative to other variables.¹⁵ Contrary to our priors, purchase premium as an indicator of overpayment is unable to discriminate the impairment sample acquirers from the control sample acquirers. We conjecture that firms in the impairment sample acquired targets that were overvalued, which could result in lower purchase premium but higher purchase price over book value. In summary, it appears that, relative to acquirers in the control sample, acquirers in the impairment sample did overpay for the original target acquisition, if overpayment is measured by the excess purchase price over target book value paid by acquirers.

¹⁵We lose a substantial number of observations when we use stock payment as a percentage of total purchase consideration reported in the SDC database as a proxy for overpayment. Hence, we use a dummy variable that indicates whether stock was used as part of the purchase consideration, although this may not be as good a proxy.

4.4.3 Initial overpayment and/or subsequent events as causes of goodwill impairment

Table 7 presents results of hypothesis H3(d) that states that goodwill impairment loss is positively correlated with indicators of initial overpayment and negatively correlated with post-acquisition performance of the acquirer. In panel A, we report Pearson correlations between impairment loss and variables used in the subsequent analysis. We find a significant positive correlation between impairment loss and purchase price in excess of target book value (Excess) as well as purchase consideration with a stock component (Stock) and a significant negative correlation between impairment loss and the one-year post-acquisition return performance (1yrRet).¹⁶ Also, excess purchase price (Excess) and stock component (Stock) are significantly positively correlated. Correlations among other variables are insignificant.

Panel B reports results of regressions of impairment loss on indicators of overpayment and subsequent performance of acquirers in the impairment sample. Consistent with the univariate analysis, we find that higher payments of purchase price over target book values at the time of the original acquisitions are related to higher subsequent impairment losses. Also, we find higher subsequent impairment losses when all or part of the purchase consideration for the original acquisitions is in the form of stock. Thus, our results are consistent with impairment loss being a consequence of initial overpayment for acquisitions made by firms in the five years prior to SFAS 142. Column 3 of panel B shows that impairment loss is significantly negatively correlated with the return performance over one year subsequent to the acquisition. Results including all variables indicate that impairment loss could be caused by initial overpayment in part and subsequent negative performance of the acquirer in part. In summary, the evidence indicates that firms that impaired

¹⁶Untabulated results show that the one-year post-acquisition market-adjusted return of the impairment sample is -13.2% for the impairment sample, which is significantly lower than that for the control sample (-2.8%).

their goodwill pursuant to SFAS 142 suffered the impairment much before the actual recognition of the loss. We conjecture that a combination of boom-time acquisitions using overvalued parent stock as cheap currency to acquire overvalued targets, followed by the market collapse and economic recession that wiped out the overvaluations, could have contributed to the impairment of goodwill.

5. Concluding Remarks

In December 2001, the FASB surprised companies and investors with a late revision to its exposure draft on goodwill accounting. The standard prohibits the age-old practice of amortization of goodwill and instead requires companies to perform a test at regular intervals to determine if the value of goodwill is impaired. As a consequence of this standard, a number of high profile companies, such as AOL Time Warner Inc., announced goodwill impairment losses running into billions of dollars. Given that the estimation of impairment losses relies largely on management's projections of future cash flows, this paper examines whether announcements of goodwill impairment losses reveal management's private information to market participants.

Our evidence shows that investors and financial analysts revise their expectations downward on the announcement of an impairment loss. In addition, we find that the impairment loss is negatively correlated with the firm's return performance over two years preceding the loss announcement, implying that the market anticipated the impairment. A significant portion of this effect occurs in Year –2, a period that coincides with the market collapse of late 2000 and 2001. Thus, it seems more likely that the sharp decline in prices led to the impairment of goodwill of these firms rather than the explanation that the market anticipated the impairment. This is especially true for companies with a single reporting unit, where the impairment could have been completely determined by the company's market price. Further analysis shows that firms in the impairment sample potentially overpaid for acquisitions made in the prior five years relative to a control sample of acquirers whose goodwill was unimpaired. The market reaction at the time of the original acquisition is also consistent with investors perceiving an overpayment by impairment firms relative to control firms. Further, we find that the subsequent impairment loss is positively correlated with our proxy for overpayment and negatively correlated with the post-acquisition return performance of impairment firms. Thus, it appears that goodwill impairment for these firms may have been caused partly by initial overpayment for recent acquisitions and partly by subsequent negative events.

Some observations emerge from our analysis that may be worth noting. First, while much of the information in the impairment loss was already impounded in prices before the announcement of the loss, it appears that SFAS 142 was effective in revealing some new information about the value of goodwill to market participants. Second, since we find impairment loss to be related to potential overpayment and post-acquisition negative performance, it seems likely that companies postponed the recognition of impairment loss until they were required to do so. Third, it is interesting to note the "driver" of impairment loss as a combination of market boom and subsequent "bust", consistent with overpayments by acquirers in boom time and overvalued assets being depleted during the bust period. Finally, if impairment losses are determined by the firm's price performance (especially for single segment firms), temporary price declines affecting balance sheet values seems worrisome. The problem gets exacerbated in light of the FASB's directive prohibiting restoration of previously booked losses. How informative are market-to-book ratios when a temporary price decline reverses, and how useful then are market-to-book comparisons across firms, are issues that need more thought and attention. While the move toward fair value accounting in general may (arguably) be a step in

the right direction, its asymmetric application in the name of conservatism could potentially lead to misleading reports.

References

- Alciatore, M., P. Easton, and N. Spear. "Accounting for the Impairment of Long-Lived Assets: Evidence from the Petroleum Industry," *Journal of Accounting and Economics* 29 (2000): 151-172.
- Ali, A., A. Klein, and J. Rosenfeld. "Analysts' Use of Information about Permanent and Transitory Earnings Components in Forecasting Annual EPS," *The Accounting Review* 67 (1992): 183-198.
- Berkovitch, E. and M. Narayanan. "Motives for Takeovers: An Empirical Investigation," *Journal of Financial and Quantitative Analysis* 28 (1993): 347-379.
- Bradley, M., A. Desai, and E. Kim. "Synergistic Gains from Corporate Acquisitions and their Division between the Stockholders of Target and Acquiring Firms." *Journal of Financial Economics* 21 (1988): 3-40.
- Campbell, J., A. Lo, and C. MacKinlay. "The Econometrics of Financial Markets." 1997. Princeton University Press, Princeton, New Jersey.
- Dimson, E. "Risk Measurement when Shares are Subject to Infrequent Trading," *Journal of Financial Economics* 7 (1979): 197-226.
- Elliot, J., and D. Hanna. "Repeated Accounting Write-Offs and the Information Content of Earnings," Journal of Accounting Research 34, Supplement 1996: 135-155.
- Erickson, M., and S. Wang. "Earnings Management by Acquiring Firms in Stock for Stock Mergers," Journal of Accounting and Economics 27 (1999): 149-176.
- Fowler, D., and C. H. Rorke. "Risk Measurement when Shares are Subject to Infrequent Trading: Comment," *Journal of Financial Economics* 12 (1983): 279-283.

- Francis, J., D. Hanna, and L. Vincent. "Causes and Effects of Discretionary Asset Write-Offs," Journal of Accounting Research 34, Supplement 1996: 117-134.
- Henning, S., and T. Stock. "The Value-relevance of Goodwill Write-Offs," Southern Methodist University Working paper, 1997.
- Henning, S., B. Lewis, and W. Shaw. "Valuation of the Components of Purchased Goodwill," *Journal of Accounting Research* 38 (2000): 375-386.
- Morck, R., A. Shleifer, and R. Vishny. "Do Managerial Objectives Drive Bad Acquisitions?" *Journal* of Finance 45 (1990): 31-48.
- Myers, S., and N. Majluf. "Corporate Financing and Investment Decisions when Firms have Information that Investors do not," *Journal of Financial Economics* 13 (1984): 187-221.
- Rees, L., S. Gill, and R. Gore. "An Investigation of Asset Write-Downs and Concurrent Abnormal Accruals," *Journal of Accounting Research* 34, Supplement 1996: 157-169.
- Roll, R. "The Hubris Hypothesis of Corporate Takeovers," Journal of Business 59 (1986): 197-216.

Table 1

Descriptive statistics of the sample of firms that announced a (transition) goodwill impairment loss from January 2002 to March 2003

Variable	N	Mean	Median	1st Quartile	3rd Quartile
Impairment Loss (\$ millions)	352	290.6	24.5	6.5	90.0
% Impairment Loss	315	66.7%	12.1%	2.3%	33.6%
EPS (\$)	315	0.04	0.05	-0.12	0.36
Change in EPS (scaled)	315	6.58%	0.42%	-1.15%	2.68%
Unexpected Earnings (scaled)	152	-0.05%	0.03%	-0.04%	0.25%
Market Value (\$ millions)	315	4,042.1	272.6	48.9	1,310.2
Total Assets (\$ millions)	313	7,415.9	719.0	163.3	2,994.8
Market-to-Book Ratio	315	1.29	1.25	0.65	1.90

Variables definitions:

Impairment loss is the transition goodwill impairment loss (net of tax) obtained from announcements appearing on the *Lexis-Nexis* database. % impairment loss is the impairment loss per share, scaled by P_{t-2} , the closing price on date *t-2* relative to the loss announcement date *t*. EPS is quarterly earnings per share before extraordinary items and discontinued operations for the fiscal quarter immediately preceding the announcement date. Change in EPS is calculated relative to the same quarter of the previous year and is scaled by P_{t-2} . Unexpected earnings are calculated as actual EPS (reported on *I/B/E/S*) for the fiscal quarter immediately preceding the announcement date minus the consensus analysts' EPS forecast, where the consensus is constructed over a period of 60 days preceding the earnings announcement date. Market value equals the closing price times the number of common shares outstanding on date *t-2*. Total assets are as reported at the beginning of the announcement quarter. Market-to-book ratio equals price per share divided by the per share book value of common equity at the beginning of the announcement quarter.

Table 2Industry classification of the sample of firms that announced a (transition) goodwill impairment loss from January 2002to March 2003

Industry description		Impairment lo	ss (\$ millions)
(2-digit SIC codes)	% of firms	Mean	Median
Oil & gas and construction (13-17)	2.3%	314.5	164.6
Paper and publishing (26-27)	4.3%	175.5	40.4
Chemicals and pharmaceuticals (28)	5.8%	300.1	33.1
Steel and metalworks (33-34)	4.6%	146.6	30.6
Machinery and electronics (35-36)	16.7%	98.8	23.8
Auto, aircraft, etc. (37-39)	8.4%	62.4	21.7
Utilities (48-49)	5.5%	156.7	120.0
Wholesalers and retailers (50-59)	9.8%	103.5	23.9
Financial services (60-63)	8.9%	258.0	6.8
Business services (73)	13.0%	135.2	14.9
Other services (>=74)	8.9%	1,835.7	22.2
Miscellaneous	<u>11.8%</u>	80.0	24.4
	100.0%		

Table 3

Market reaction to the announcement of goodwill impairment loss

Panel A: Mean 3-day abnormal return centered on the loss announcement date for (i) all firms, (ii) firms with positive unexpected earnings, (iii) firms with negative unexpected earnings, and (iv) firms that did not announce earnings in the loss announcement window ("No Overlap").

	All Firms	Positive UE ^a	Negative UE ^a	No Overlap
Full sample: N	308	188	106	14
3-day Abnormal Return J-test (p-value)	-0.0048 (0.0310)	0.0004 (0.4483)	-0.0118 (0.0174)	-0.0224 (0.0559)
% Negative Abnormal Return	52.6%	50.5%	54.7%	64.3%
I/B/E/S Sample : N	152	99	46	7
3-day Abnormal Return J-test (p-value)	-0.0143 (0.1200)	0.0024 (0.8046)	-0.0504 (0.0207)	-0.0145 (0.4066)
% Negative Abnormal Return	53.3%	47.5%	63.0%	71.4%

Table 3 continued

Panel B: Effect of goodwill impairment loss on 3-day abnormal return

$$AR_{i} = \alpha_{0} + \alpha_{1}ILOSS_{i} + \alpha_{2}UE_{i} + \varepsilon_{i}$$
(1)

Dependent variable is 3-day abnormal return (AR_i)

	Full Sample	I/B/E/S Sample
N	308	152
Intercept	-0.0011 (0.8608)	0.0084 (0.3669)
ILOSS	-0.0128 (0.0820)	-0.0913 (0.0001)
UE ^a	0.0159 (0.0002)	0.4824 (0.0648)
Adj-R ²	5.2%	17.6%

p-values in parentheses.

^aFor the full sample, unexpected earnings is measured as the seasonal change in EPS for the fiscal quarter immediately preceding the loss announcement date, scaled by P_{t-2} . For the *I/B/E/S* sample, unexpected earnings equal *I/B/E/S* actual EPS minus the consensus analysts' EPS forecast for the quarter immediately preceding the loss announcement date, scaled by P_{t-2} . The consensus forecast is constructed over a period of 60 days preceding the earnings announcement date. ^bJ-test as defined in Campbell, Lo, and MacKinlay (1997).

Variable definitions:

3-day abnormal return is the abnormal return on day centered on the loss announcement date. Abnormal returns are calculated using the market model estimated over a period of 120 days ending on day -3 relative to the loss announcement date and adjusted for infrequent trading and bid-ask bounce. ILOSS is the goodwill impairment loss per share, scaled by P_{t-2} .

Table 4

Effect of goodwill impairment loss on analysts' EPS forecast revisions

Panel A: Mean EPS forecast revision made within the 60-day post loss-announcement period to (a) forecasts of all subsequent quarters, (b) forecast of the immediately succeeding quarter, and (c) one-year ahead forecast, reported for (i) all firms, (ii) firms with positive forecast errors, (iii) firms with negative forecast errors, and (iv) firms that did not announce earnings in the loss announcement window ("No Overlap").

Forecast Revision of:		All Firms	Positive FE	Negative FE	No Overlap
a.	All Subsequent Quarters N	356	227	102	27
	Forecast Revision (scaled) t-test (p-value)	-0.0025 (0.0001)	-0.0022 (0.0001)	-0.0032 (0.0004)	-0.0030 (0.0859)
b.	Next Quarter N	121	79	36	6
	Forecast Revision (scaled) t-test (p-value)	-0.0035 (0.0001)	-0.0032 (0.0004)	-0.0039 (0.0123)	-0.0052 (0.3279)
c.	One-Year Ahead N	115	77	32	6
	Forecast Revision (scaled) t-test (p-value)	-0.0063 (0.0078)	-0.0009 (0.6738)	-0.0200 (0.0017)	-0.0021 (0.2141)

Table 4 continued

Panel B: Results of regression of analysts' forecast revisions on goodwill impairment loss and the most recent forecast error

$$REV_{i} = \beta_{0} + \beta_{1}ILOSS_{i} + \beta_{2}FE_{i} + \omega_{i}$$
⁽²⁾

	All Subsequent	Next	One-Year
	Quarters	Quarter	Ahead
Ν	356	121	115
Intercept	-0.0021	-0.0027	-0.0023
	(0.0001)	(0.0012)	(0.2841)
ILOSS	-0.0024	-0.0040	-0.0151
	(0.0487)	(0.0621)	(0.0001)
FE	0.0789	0.0726	0.4475
	(0.0226)	(0.0555)	(0.0001)
Adj-R ²	2.4%	5.3%	29.6%

Dependent variable is forecast revision (REV_i)

p-values in parentheses.

Variable definitions:

Forecast revision (REV) equals consensus analysts' EPS forecast over a period of 60 days following the loss announcement date minus the consensus EPS forecast for the same quarter over a period of 60 days preceding the loss announcement date, scaled by P_{t-2} . Forecast error (FE) is measured as I/B/E/S actual EPS minus the consensus analysts' EPS forecast for the quarter immediately preceding the loss announcement date, scaled by P_{t-2} . The consensus forecast is constructed over a period of 60 days preceding the earnings announcement date.

Other variables are defined in Table 3.

Table 5

Anticipation of goodwill impairment loss by the market

Panel A: Compounded raw and market-adjusted returns of quarters preceding the announcement quarter for (i) the full sample, and (ii) the sample of firms with impairment loss in excess of 5% of market value (MV) at the beginning of the return accumulation period

	Ν	Mean	Median	T-test (p-value)	Wilcoxon (p-value)
Full sample					
Raw Returns:					
Quarters (t-4) to (t-1)	300	-0.0413	-0.0486	(0.1113)	(0.1182)
Quarters (t-8) to (t-1)	300	-0.2314	-0.2653	(0.0001)	(0.0001)
Market-adjusted Returns:					
Quarters (t-4) to (t-1)	300	-0.0685	-0.0487	(0.0083)	(0.0112)
Quarters (t-8) to (t-1)	300	-0.2265	-0.2569	(0.0001)	(0.0001)
Impairment > 5% of MV					
Raw Returns:					
Quarters (t-4) to (t-1)	173	-0.0194	-0.0400	(0.5918)	(0.5205)
Quarters (t-8) to (t-1)	158	-0.2343	-0.3252	(0.0001)	(0.0001)
Market-adjusted Returns:					
Quarters (t-4) to (t-1)	173	-0.0574	-0.0343	(0.1160)	(0.1168)
Quarters (t-8) to (t-1)	158	-0.2395	-0.3231	(0.0001)	(0.0001)

Table 5 continued

Panel B: Results of regression of returns of prior quarters on earnings of prior quarters and the impairment loss

$$R_{it-\tau,t-1} = \gamma_0 + \gamma_1 ILOSS_{it} + \gamma_2 E_{it-\tau,t-1} + u_{it-\tau,t-1} \qquad \tau = 4, 8$$
(3)

	Full Sample		Impairment > 5% of MV		
Dependent Variable:	R _{it-4,t-1}	R _{it-8,t-1}	R _{it-4,t-1}	R _{it-8,t-1}	
N	300	300	173	158	
Intercept	-0.0146 (0.2944)	-0.1665 (0.0001)	0.0179 (0.3232)	-0.1134 (0.0076)	
ILOSS	0.0064 (0.3826)	-0.0911 (0.0992)	-0.0052 (0.4119)	-0.1625 (0.0181)	
E _{it-τ,t-1}	0.1942 (0.0002)	0.3433 (0.0001)	0.1575 (0.0072)	0.2901 (0.0001)	
Adj-R ²	3.9%	15.6%	3.0%	18.6%	

p-values of one-tail tests of directional hypotheses are reported in parentheses

Variable definitions:

In Panel A, market-adjusted returns are measured relative to the equally weighted market index. In Panel B, returns and earnings are measured over quarters (*t*-4) to (*t*-1) for columns (1) and (3) and quarters (*t*-8) to (*t*-1) for columns (2) and (4). R_{it- τ ,t-1} = security returns compounded from the beginning of quarter (*t*- τ) up to the end of quarter (*t*-1), where $\tau = 4$, 8. E_{it- τ ,t-1} equals the sum of EPS of quarters (*t*- τ) to (*t*-1), divided by price at the beginning of quarter (*t*- τ), where $\tau = 4$, 8. ILOSS equals impairment loss divided by market value at the beginning of quarter (*t*- τ).

Table 6

Abnormal returns and other descriptive statistics relating to acquisitions made by the sample of impairment firms and a control sample of year and industry-matched acquirers during 1997-2001.

Panel A: 3-day abnormal returns earned by acquirers and targets on the announcement of acquisitions, reported separately for the impairment and control samples

	Impairme	nt Sample	Control Sample		
	Acquirer	Target	Acquirer	Target	
N	1,430	129	12,312	1,021	
Mean	0.0021	0.2389	0.0075	0.1996	
Median	-0.0007	0.1857	0.0007	0.1538	
T-Test (p-value)	(0.2882)	(0.0001)	(0.0001)	(0.0001)	
Wilcoxon (p-value)	(0.5436)	(0.0001)	(0.0001)	(0.0001)	
T-test: Difference in means ^a Median 2-Sample Test ^a			(0.0143) (0.1442)	(0.0518) (0.0806)	

Panel B: Means and medians of indicators of overpayment of the impairment and control samples

	Impairment Sample		Control Sample			Difference		
Variables	N	Mean	Median	N	Mean	Median	T-Test ^c	Wilcoxon ^d
							(p-value)	(p-value)
Impairment loss (% of Total Assets)	90	6.5%	3.2%	-	-	-	-	-
% Excess Acquisition Price (Excess)	90	321.6%	180.1%	974	250.5%	104.6%	(0.0794)	(0.0283)
% Purchase Premium (Premium)	77	36.9%	33.2%	838	38.7%	32.5%	(0.7193)	(0.9318)
Stock Consideration (Stock)	90	0.249	0.167	974	0.373	0.254	(0.0022)	(0.0334)
Number of Bidders (#Bids)	90	0.009	0	974	0.017	0	(0.4758)	(0.3011)

Table 6 continued

Panel C: Results of logistic regression investigating the relation between the probability of subsequent goodwill impairment and indicators of overpayment for the original acquisition

Dependent variable equals one if the observation belongs to the impairment sample, and zero if the observation belongs to the control sample

N	1,064	915	812
Intercept	-2.0835	-1.8739	-1.8858
	(0.0001)	(0.0001)	(0.0001)
Excess	0.0164	0.0171	0.0137
	(0.0280)	(0.0259)	(0.0554)
#D:4-	4.0400	0.0045	1 00 40
#BIOS	-1.3429 (0.2279)	-0.8045 (0.3317)	-1.0049 (0.3046)
		(*****)	()
Stock	-1.0986	-0.9910	-0.9222
	(0.0010)	(0.0046)	(0.0010)
Premium	-	-0.1868	-
		(0.2724)	
Size	-	-	0.0001
			(0.2010)
Pseudo-R ²	4.5%	3.9%	3.3%

^aOne-tail test of difference in mean abnormal returns of acquirers and targets in the impairment versus the control samples.

^bOne-tail 2-sample test of difference in median abnormal returns of acquirers and targets in the impairment versus the control samples.

^cTwo-tail test of difference in means of the two samples.

^dTwo-tail non-parametric 2-sample Wilcoxon test of difference in distributions of the 2 samples.

Control sample includes firms that belong to the same 2-digit SIC code and that made acquisitions in the same year as the impairment firm. All variables for the above analysis are means per acquirer.

Variable definitions: Impairment loss is expressed as a percentage of total assets at the beginning of the loss announcement quarter. Excess equals purchase price for the acquisition minus the book value of target, divided by the book value of target, where book value is as reported at the beginning of the acquisition announcement quarter. Premium equals price paid to target shareholders minus the target price one week prior to the acquisition announcement (PR1week), divided by PR1week. #Bids equals 1 if there were multiple bidders for the target and zero otherwise. Stock equals 1 if the purchase consideration for the acquisition was partly or fully paid in the form of stock, and zero otherwise. Size equals market value of equity one day prior to the acquisition announcement.

Table 7

Initial overpayment and subsequent performance as indicators of impairment loss

Panel A: Pearson correlations of original acquisition related variables for the impairment sample

Variables	Excess	Premium	Stock	#Bids	1yrRet
ILOSS	0.200**	0.065	0.221*	-0.069	-0.215 [*]
Excess		0.119	0.177**	0.007	0.074
Premium			-0.075	0.041	0.036
Stock				-0.013	-0.127
#Bids					0.085

*, ** Significant at the 5% and 10% levels, respectively.

Panel B:	Results of	regression	of impair	nent loss	on indicator	s of initial	l overpayment	and subsequent	performance
		0	1				1 2	1	1

N	90	90	84					
Intercept	0.0566 (0.0001)	0.0443 (0.0003)	0.0419 (0.0012)					
Excess	0.0026 (0.0294)	0.0022 (0.0582)	0.0028 (0.0428)					
#Bids	-	-0.1635 (0.2560)	-0.1280 (0.3069)					
Stock	-	0.0607 (0.0364)	0.0449 (0.1215)					
1yrRet	-	-	-0.0510 (0.0282)					
Adj-R ²	2.9%	4.8%	7.3%					

Dependent variable is impairment loss

p-values of one-tail tests in parentheses

Table 7 continued

The sample includes all acquisitions made by firms in the impairment sample during the five-year period 1997-2001 for which acquisition-related data is available on the SDC database. Variables that are proxies for initial overpayment and subsequent performance are means per acquirer.

Variable definitions:

Impairment loss is expressed as a percentage of total assets at the beginning of the loss announcement quarter. 1yrRet is measured as security return of each acquirer over a period of one year starting on day +3 relative to the acquisition announcement date.

Other variables are as defined in Table 6.