Abnormal Returns Following Goodwill Impairment Write-Offs

Introduction

Do large goodwill impairment write-offs have a greater market reaction than small ones in terms of the post-event returns? Does the abnormal return pattern differ depending on the direction of the current market sentiment at the time of the announcement (bull versus bear market)? This study addresses these questions. Our results imply a substantive opportunity for investors, and considerable guidance for managers concerning the timing and amplitude of the impairment write-down.

Market reactions to goodwill impairment write-downs are quite pronounced and logically negative since the write-off of the assets, even though they are intangible, decreases the overall asset value of the firm. However, the long term reaction to these write-offs is positive. One possible explanation for the long term positive returns post impairment write-offs is that the managers of the firm are using the required write-offs to incorporate all potential future write-offs. This could lead to more positive future returns. Similarly, if the overall market sentiment is bearish the expectations placed on managers regarding their firm's stock price performance is lessened. Thus, an opportunity may exist in a bear market to increase the write-off even further with few immediate consequences and a potential for strong performance in the subsequent quarters.

Accounting standards for the treatment of goodwill changed significantly in 2002, with the adoption of Statement of Financial Accounting Standards (SFAS) 141 and 142. Rather than being treated as a wasting asset and amortized according to a predetermined system, goodwill must now be reassessed on an annual basis, and if its value is perceived to have fallen, written off accordingly. While a set of guidelines exists for revaluing goodwill, there is substantial flexibility in the process, which depends largely on perceptions of future benefits. Rather than a smooth and consistent write-down, impairment values can range from initial book value, essentially considered a perpetual asset creating continuous benefits, to a total write-off with the notion that the entire excess price over fair value paid for a target company is no longer substantiated. As a result, goodwill impairment write-downs have the potential to be quite large compared to a firm's total assets and can have a considerable impact to a firm's earnings.

With the implementation of the changes to goodwill accounting rules in 2002, firms are required to assess all goodwill on the balance sheet for impairment on an annual basis. If the goodwill is found to be impaired, it must be immediately written-off. Prior to the rule changes this write-off had a negative impact on stock prices both in the short term (Hirschey and Richardson 2003; Bens et al. 2011) and in the long term (Bartov et al. 1998; Hirschey and Richardson 2003). However, Cheng, Peterson, and Sherrill (2015) show that after the implementation of the new rules, investors view this impairment write-down as a positive event, and subsequently, the firm's stock price increases.

There are theoretical justifications for the behavior. Several studies find evidence of companies' using the accounting change as an opportunity to practice varying levels of earnings management. Jahmani, Dowling, and Torres (2010) find that companies with goodwill that experience losses do not necessarily impair their goodwill. Ramanna (2008) also finds that opportunism in the implementation of the new rules is likely. Consistent with this, Cheng, Cheng, Peterson, and Sherrill (2015) suggest that managers use a "big bath" approach to take all the negative impact at one time.

The "big bath" hypothesis suggests that lumping additional losses in with an already negative performance may not have a much more significant negative impact than that of the original negative performance micro-environment. This leaves the firm with a strong potential for favorable subsequent quarters.

This "big bath" approach to representing losses where an entity overstates the current negativity in order to position themselves for stronger subsequent quarters is documented in other situations. Fiechter and Meyer (2010) suggest that banks used this "big bath" approach during the financial crisis. Nieken and Sliwka (2015) suggest that when a firm has a change in management, the new manager will often negatively overstate the results in his first quarter since the poor performance can be attributed to his predecessor, thus setting the stage for subsequent good performance which will be attributed to him.

Similarly, with the new rules, while the timing of goodwill assessment is essentially pre-determined, the amount may be justifiable in a wide range of values. Among fair value estimation models, the cash-flow model, where estimates and discount rates are used to determine the values, while needy of justification to auditing entities, are largely determined using an expectations framework. Thus, while the valuation of the impairment is limited to the downside, the potential for inflating the size of the impairment exists, providing the flexibility for initiating a "big bath."

If firms use this "big bath" concept and take even larger impairments than required, are investors savvy enough to reward this behavior. Will firms with larger goodwill impairments have more positive returns post impairment?
A second consideration is that investors' have different expectations in a bear market versus a bull market (Kim and Zumwalt, 1979). Kim and Ismail (1998) find that, "…accounting data provides important information on security behavior in up-and down-markets." Thus, we examine if the goodwill impairment is perceived the same in up markets and down markets. Investors may treat risk differently depending on the market status overall.

Additionally, if a firm's stock price performs poorly in a bull market, the responsibility for the poor performance is placed directly on the management team. However, in a bear market there is much more latitude given to managers' performance. Some, if not all the responsibility of the poor stock price performance can be attributed to the macro-environment and the overall bearish market conditions. Therefore, if a manager takes a write-off of assets in a bear market, there may be an

opportunity to increase the write-off with few repercussions in the short term and thus position the firm for significant strong performance in the future.

An impairment write-down could also be noticed to a larger degree when analysts are diligently looking for positive market signals from firms. If the macro-environment is trending negative, the marginal effect may be less noticeable than in a generally up market. This implies that managers can maximize the shareholder value increase by taking goodwill impairment write-downs in bear markets as opposed to bull markets. In generally rising markets, good news tends to abound. If a goodwill impairment occurs amongst the good news noise, it may not be as noticeable as it could be in an environment of stagnation or decline; if noticed, the valuation reaction may be more muted than in an environment of stagnation or decline.

These theoretical underpinnings, unsubstantiated in prior literature, provide a compelling motivation for testing our two estimation hypotheses:

Proposition 1

H_0: There is no significant difference in long term post-impairment write-down abnormal return performance between large relative write-offs and small relative write-offs (as measured by the amount of the write-off as a proportion of the firm's total assets lagged one quarter).

Proposition 2

H_0: There is no significant difference between the long term post-impairment write-down abnormal return performances in generally rising versus generally falling stock markets.

Literature

Several prior studies form a foundation for this paper. Shalev (2009) and Lys, et. al. (2011) verify that goodwill can be a substantial portion of the acquisition price, a 55% goodwill to purchase price ratio on average. Cheng, et. al. (2015) document that, while prior to the rule change in 2002 roughly 30% of all firms had goodwill, by 2010 that proportion had increased to 37%. The implication is that there are large amounts of potential write-offs that may occur frequently and in large magnitude.

The pre-rule-change negative shock of -2.94% to -3.52% immediately following an impairment announcement within the two-day window around announcement was substantiated by Hirschey and Richardson (2003). A more recent study found a -3.3% abnormal return using both pre and post rule change (Bens, et. al. 2011). Cheng, Peterson, and Sherrill (2015) found a post rule change abnormal return amounting to -1.76% over a two day period.

Studies using pre 2002 data conclude substantive negative longer term returns after an impairment announcement. Bartov, et. al. (1998) found a mean CAR in the year following an asset write-down

of -12%, although they used write-downs of all types of assets. Examining strictly goodwill impairment write-offs, Hirschey and Richardson (2003) also found a negative return of 11.02% in the year following the announcement. However, Cheng, Peterson, and Sherrill (2015) using data post-2002 rule change, find that the long term cumulative abnormal return is 18.53% and 28.6% for six months and one year respectively.

The questions framed in this study are addressed using post 2002 data, and thus capture any differences that may have occurred as a result of the paradigm change.

Data and Methodology

Data

Our dataset includes all U.S. firms listed on the AMEX, NYSE, and NASDAQ stock exchanges with the exception of financial firms (SIC codes 6000-6999) and utilities (SIC codes 4900-4999). The new requirements for goodwill assessment became effective in fiscal year 2002, so our data is for fiscal years 2002-2017. All accounting data including amount of goodwill and goodwill impairments are from Compustat via Wharton Research Data Services (WRDS). Stock price data, and number of shares outstanding as well as value-weighted and equal-weighted market return data is from the Center for Research in Security Prices (CRSP) also accessed via WRDS. Market status dates identifying a generally up versus a generally down financial market are established using the methodology found in Gutierrez, et.al. (2014).The Fama and French two digit industry codes are obtained from Kenneth French's website. We only use firms if they have a positive value for assets and for assets lagged one quarter.

The number of firms that meet our criteria and that have a value for goodwill are shown in Table I by fiscal year and quarter. Additionally, we calculate the percentage of firms with goodwill. We calculate the mean value of the goodwill for the firms that have a value for goodwill. Finally, we calculate the goodwill value as a percent of all assets, lagged one quarter.

INSERT TABLE I HERE

We identify by fiscal year and quarter the number of firms that have a negative value for goodwill impairments. We calculate the percent of firms that have an impairment from the total number of firms that have a goodwill amount by fiscal year and quarter. We then calculate the mean value of the impairment for all firms with impairments. We scale the impairment amount by total assets and then by total assets lagged one quarter. This is shown in Table II.

INSERT TABLE II HERE

For the CAR calculations, we use the earnings announcement date from Compustat as the event date for the impairment write-down. We have 4,476 firm quarters. A firm may appear in more than one quarter if the firm has multiple goodwill impairment write-downs.

The impairment size quintiles are based on the amount of the impairment scaled by assets lagged one quarter. The quintiles are calculated based on the entire timeframe. Each individual firm-quarter is then placed in one of the quintiles.

The status of the market, up or down is based on sustained market direction. A movement up or down in excess of 10% constitutes significant general movement. Market cap is the absolute value of the price of the firm's stock on the day of the earning's announcement that includes an impairment, times the number of shares of stock outstanding.

Methodology

The CAR (cumulative abnormal return) is obtained by calculating the difference between the individual stock's return and the value weighted market return for each day in the event window. We then sum these abnormal returns for the entire event window by firm. The CAR is the average of these abnormal returns as shown in equation 1

$$\overline{CAR}\ (t_2, t_{127}) = \frac{1}{N}\sum_{i=1}^{N} CAR_i\ (t2, t_{127}) \qquad (1)$$

where t_2 is the first day of the event window, in this case the day after the two day period of the impairment announcement, and t_{127} is 125 days after the two day event window. This same formula is used for the 250 day CAR calculation, only the number of days used is greater. If there is not a full complement of days for a firm, we use the CAR from the days the firm has available. However, firms must have at least 30 days of returns to be included in the CAR analysis. We find both the mean difference and the median difference. We do this same analysis using the equal weighted market return as our proxy for normal as a robustness check.

We test for differences between large relative write-offs and small relative write-offs by sorting on the size of the write-off. The impairment amount is scaled by assets lagged one quarter. All scaled impairments are then sorted from the entire time frame into quintiles. Each observation is assigned to an impairment size quintile. Quintile 1 is the quintile with the smallest relative impairment amounts and quintile 5 is the quintile with the greatest relative impairment amounts. Six month and 1 year CARs are calculated by size quintile using equation 1.

Proposition 2, the hypothesis that there is no significant difference between the post-impairment write-down performance in generally rising versus generally falling stock markets, is tested by

assigning a market status indicator, up or down to each firm quarter based on the event date. CARs are then calculated using equation 1 for the firms with the impairment event occurring in a down market and then for the firms with the impairment event occurring in an up market.

We estimate an OLS regression of the CARs on the market status, impairment size, and firm size. The regressions use industry fixed effects and are corrected for potential heteroscedasticity in the error terms. Standard SIC codes are converted into the two digit Fama and French industry codes and are used for industry fixed effects.

BHARs (buy and hold abnormal returns) are calculated for abnormal returns using a market adjusted model. The abnormal BHAR is calculated by multiplying the return relatives of the event firm's return for the specified time period and then subtracting the product of the return relatives of the value-weighted market returns for the same days, as shown in equation 2.

$$BHAR_i = \prod_{t=2}^{T}(1 + R_{event\ firm\ i,t}) - \prod_{t=2}^{T}(1 + R_{market\ i,t}) \quad (2)$$

We then report the mean and median values for the entire population of event firms. Statistical significance for the mean is found using a t-test and statistical significance measures for the median are found using a signed rank test. We do this for both a six-month (125 day) time period and a full year (250 day) time period.

Results

Cumulative abnormal returns (CARs) were examined using both value-weighted market and equal-weighted market returns as our proxy for normal. CARs were calculated for both a six month and full year period. We calculate the mean and median values for the CARS and note their statistical significance. These results are shown in Table III. The median significance is determined by a signed rank test, (S test in SAS).

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After the goodwill impairment is taken, the mean CAR for the six months after the event using the value-weighted market return as a proxy for normal is 14.44%. This is statistically significant at the 1% level. The median return is 7.36% again significant at the 1% level.

The results for the full year (250 day) CAR using the value-weighted market return as our proxy for normal are even more pronounced. The mean is 22.72% and the median 12.42% both significant at the 1% level.

Using the equal-weighted market return as a proxy for normal results in more muted abnormal returns however, we still have mean CARs of 9.31% and 15.01% for 6 month and one year periods respectively. The median CARS are 4.15% and 7.4% respectively. All results are significant at the 1% level.

While our methodology is slightly different, our results are consistent with previous findings of Cheng, Peterson, and Sherrill (2015). This provides validity to our method. However, our contribution is how the impairment size and the status of the market impact the returns.

We sort the data into quintiles based on the impairment amount scaled by assets lagged one quarter. One set of quintiles was created for the entire time period. While a firm may appear multiple times within a quintile or in more than one quintile, it would be for different impairment write-downs during different quarters and/or years. We calculate the mean and median CARS for each impairment size quintile. We use the value-weighted market return as our proxy for normal in these calculations. Again, we do this for both the 6 month and 1 year CARS. Quintile one has the smallest relative impairments size and quintile five has the greatest relative impairments size. The results are shown in Table IV.

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The firms with the smallest relative impairment have the lowest mean CARs after the event and the firms with the largest relative impairment have the greatest mean CARs after the event. There is a perfectly monotonic pattern in mean CAR values with respect to the impairment size quintile. The smallest impairment size quintile has a mean CAR value of 3% for the 125-day CAR and 6% for the 250-day CAR, while the largest impairment size quintile has a mean CAR value of 30% and 46.6% for 125-day and 250-day respectively. This is consistent with the idea that investors see the goodwill impairment as a positive event. It is suggestive that investors appreciate that managers use the impairment to take all foreseeable write-offs. Thus, the larger the relative impairment write-off, the better the expectations on future performance.

We then test the hypothesis that there is no difference in the post- impairment returns in a generally up market versus a generally down market, again via a sort of the CARs. A market status (up or down) is assigned to each event date. Mean and median CARs (using the value-weighted market return as our proxy for normal) are then calculated for all firms with the event being in a generally down market, and then for all firms with the event being in a generally up market. Table V shows the CAR results for both 6 months and 1 year after the event, by the market status.

INSERT TABLE V HERE

Impairments taken in a generally down market result in subsequent returns that are almost three times as large as the subsequent returns for impairments taken in a generally up market. When the impairment event occurs in a time when the market is generally up the mean CAR values for 6 months and 1 year respectively are 10.5% and 16.8%. If the impairment write-off is taken in a generally down market then the mean CAR values for 6 months and 1 year respectively are 34.4% and 53.1%. All are significant at the 1% level.

This is consistent with the idea that managers will utilize the opportunity of a down market to write-off all foreseeable future impairments. The performance expectation for a firm in a down market are much less than in an up market. By taking advantage of the lowered expectations, the firms can be positioned to have even better future performance than they otherwise would.
If our hypotheses are both correct, than investor expectations should be that firms that have the largest write-offs in down markets should have the best future performance. To test this, we perform a combined sort based on both market status (up versus down) and the relative impairment size using the pre-established quintiles. We calculate the mean and median CAR values. The results are shown in Table VI. The largest relative impairments taken in a down market yield the highest subsequent returns.

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For the six month time period, firms with impairments of the largest relative size, taken in a generally down market have mean CARs of 51.11%, versus firms with impairments of the smallest relative size, taken in an up market which have mean CARs of 3.2%. For the one year period the mean CARs are 79.39% for firms with the largest relative impairments in a down market versus 5.88% for firms with the smallest relative impairments taken in an up market. These results are all statistically significant at the 1% level with the exception of the results for the smallest impairment quintile in a down market. We do not have statistical significance for these results in either the six-month or the full year period.

As a robustness test, we estimate ordinary-least square regressions using both the six month and the one year CAR results. The CARs for the individual firm-quarters are our dependent variable. We first use the market status as a regressor. We also use industry fixed-effects. We use the Fama and French two digit industry code to identify the industry. We also correct for potential heteroscedasticity in the error terms. The coefficient estimate on the market status is economically significant as well as statistically significant at the 1% level. However, we do have a statistically significant intercept. The results are shown in Table VII.

INSERT TABLE VII HERE

Next we add the size of the impairment write-off scaled by assets lagged one quarter. Both impairment size and market status coefficient estimates are economically and statistically significant. Adding the impairment size regressor removes any statistical significance from the intercept and slightly increases the R-square of the regression.

Lastly, we add firm size to ensure that the results are not simply capturing the small firm effect. A smaller firm will generally have a lower asset level, making a similar size impairment a greater relative impairment. Thus, large relative impairment firms may be the smallest sized firms. The coefficient estimates on the market status and relative impairment size remain economically and statistically significant, however the coefficient estimate on the market size regressor is not statistically significant indicating that the size of the firm, as measured by market capitalization is not driving the higher CARs.

Since a buy and hold abnormal return (BHAR) is more indicative of the investor's experience, we also analyze the abnormal returns post event using this methodology as a robustness check. These results are shown in Table VIII. We find that the mean BHAR for the six months post event is 17.4%, and for one year is 31.2%. Both of these are statistically significant at the 1% level.

INSERT TABLE VIII HERE

We then use the BHAR methodology to examine the results in a generally up versus a generally down market. Consistent with our CAR analysis, we find a substantially higher abnormal return post-event for the down market versus the up market. For six months the mean abnormal BHAR is 12.08% in up markets and 31.17% in down markets. For the one year analysis the mean BHAR is 23.91% in up markets versus 56.69% in generally down markets. Again these results are statistically significant at the 1% level. These results are shown in Table IX.

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Conclusions

It is rare for research hypotheses regarding CARs to yield such high levels of significance as in our results. The study allows us to draw some bold conclusions about the market reactions to goodwill impairment write-offs.

Our empirical tests show that the larger the value of the impairment write-off relative to assets, the greater the subsequent returns, providing evidence that the null hypothesis is not valid and that investors perceive differences in the information conveyed by small relative impairments compared to large relative impairments.

Further, there is a strong indicator that the market sentiment (generally rising versus generally falling) under which a goodwill impairment write-off occurs has a significant effect on the post-event performance. Managers who take goodwill impairment write-downs in generally down markets can obtain stock price increases of almost twice as much as similar goodwill impairment write-downs taken in bull markets.

The implications for both investors and managers are potentially quite influential. Once again our evidence invalidates the null hypothesis. The status of the market is significant to the information extracted from the impairment event.

Our results suggest an investment strategy; when firms announce a goodwill impairment investors should buy after the initial downward shock, and the return will be greater with larger relative impairment size. This strategy has the greatest return on average when the market is generally down.

Our results suggest to managers that if they are required to take a goodwill impairment write-down based on the current accounting rules, they would be well-served to impair as much of the goodwill as possible. It may be convenient to do so during a down market since valuations of assets in general would be diminished, and the positive post-event stock price reaction is larger on average than in an up market.

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Table I: Descriptive Statistics for Goodwill

This is data from U.S. firms on the AMEX, NYSE, or NASDAQ with the exception of financial firms and utilities, for fiscal years 2002-2017. The date is by fiscal year and quarter as the amount of goodwill on the balance sheet fluctuates throughout the year. Dollar amounts are in millions of dollars. The average amount of goodwill is the mean using only firms that have a positive goodwill balance. The average goodwill as a percent of lagged assets is the ratio of goodwill to assets lagged one quarter averaged across the firms that have goodwill on the balance sheet for the particular fiscal year and quarter.

Fiscal Year	Quarter	Number of Firms	Number of Firms with Goodwill	Percent of Firms with Goodwill	Average Amount of Goodwill for the Firms that have Goodwill (M$)	Average Goodwill as a Percent of Lagged Assets
2002	1	3445	1464	42.50%	580.89	18.04%
2002	2	3576	1611	45.05%	513.11	16.77%
2002	3	3543	1711	48.29%	516.23	18.25%
2002	4	3500	2026	57.89%	452.89	16.23%
2003	1	3484	1859	53.36%	486.37	16.95%
2003	2	3617	1862	51.48%	505.90	17.57%
2003	3	3572	1876	52.52%	541.54	17.45%
2003	4	3516	2174	61.83%	502.31	17.11%
2004	1	3465	1962	56.62%	548.56	18.25%
2004	2	3567	1991	55.82%	562.43	17.96%
2004	3	3532	2017	57.11%	567.99	18.15%
2004	4	3470	2246	64.73%	535.43	20.71%
2005	1	3445	2073	60.17%	568.82	18.58%
2005	2	3580	2076	57.99%	591.00	22.59%
2005	3	3515	2088	59.40%	613.21	19.19%
2005	4	3451	2274	65.89%	575.26	18.88%
2006	1	3403	2087	61.33%	642.70	19.16%
2006	2	3497	2080	59.48%	676.01	18.88%
2006	3	3450	2078	60.23%	693.97	19.37%
2006	4	3351	2258	67.38%	698.74	18.44%
2007	1	3315	2064	62.26%	752.85	19.65%
2007	2	3353	2053	61.23%	775.33	19.65%
2007	3	3283	2028	61.77%	799.96	19.53%
2007	4	3186	2165	67.95%	779.44	19.77%
2008	1	3140	2002	63.76%	842.59	20.90%
2008	2	3204	1980	61.80%	859.61	19.57%
2008	3	3159	1964	62.17%	853.21	19.17%
2008	4	3107	1992	64.11%	789.75	17.44%
2009	1	3096	1802	58.20%	851.94	18.17%
2009	2	3219	1784	55.42%	869.35	18.30%
2009	3	3172	1792	56.49%	898.26	18.41%
2009	4	3102	1973	63.60%	847.35	17.98%

Table I: Descriptive Statistics for Goodwill (continued)

Fiscal Year	Quarter	Number of Firms	Number of Firms with Goodwill	Percent of Firms with Goodwill	Average Amount of Goodwill for the Firms that have Goodwill (M$)	Average Goodwill as a Percent of Lagged Assets
2010	1	3071	1796	58.48%	931.68	18.33%
2010	2	3144	1794	57.06%	933.76	18.10%
2010	3	3098	1788	57.71%	958.95	18.45%
2010	4	3030	1942	64.09%	938.40	17.95%
2011	1	2990	1801	60.23%	1003.29	18.32%
2011	2	3127	1809	57.85%	1025.89	18.43%
2011	3	3082	1799	58.37%	1041.55	17.98%
2011	4	3016	1952	64.72%	1009.73	17.96%
2012	1	2993	1798	60.07%	1076.73	18.25%
2012	2	3202	1805	56.37%	1090.12	18.18%
2012	3	3161	1797	56.85%	1117.76	30.60%
2012	4	3117	1995	64.00%	1033.80	18.23%
2013	1	3105	1811	58.33%	1096.12	17.86%
2013	2	3279	1830	55.81%	1110.57	17.96%
2013	3	3232	1844	57.05%	1134.41	18.21%
2013	4	3182	2055	64.58%	1086.61	18.06%
2014	1	3162	1875	59.30%	1165.07	21.24%
2014	2	3253	1900	58.41%	1162.52	18.63%
2014	3	3207	1927	60.09%	1154.68	18.87%
2014	4	3139	2107	67.12%	1126.38	18.44%
2015	1	3114	1956	62.81%	1178.50	19.02%
2015	2	3224	1961	60.83%	1216.86	20.06%
2015	3	3159	1947	61.63%	1263.49	19.05%
2015	4	3104	2063	66.46%	1232.76	19.23%
2016	1	3086	1927	62.44%	1311.57	19.37%
2016	2	3097	1932	62.38%	1348.18	19.83%
2016	3	3046	1910	62.71%	1369.66	22.28%
2016	4	2980	1985	66.61%	1352.93	20.03%
2017	1	2943	1895	64.39%	1422.39	19.88%
2017	2	2956	1896	64.14%	1460.44	20.39%
2017	3	2864	1870	65.29%	1554.57	20.71%
2017	4	2217	1605	72.40%	1720.78	19.97%

Table II: Descriptive Statistics for Goodwill Impairments

This is data from U.S. firms on the AMEX, NYSE, or NASDAQ with the exception of financial firms and utilities, for fiscal years 2002-2017. The date is by fiscal year and quarter as goodwill impairment amounts on the balance sheet fluctuate throughout the year. Dollar amounts are in millions of dollars. The average impairment amount is the mean impairment value using only the firms that have an impairment. Average impairment as a percent of total assets is calculated using the assets in the same quarter as the impairment.

Fiscal Year	Quarter	Number of Firms	Number of Firms With Goodwill Impairments	% of Firms with Goodwill that have Impairments	Average Impairment Amount for Firms with Impairments	Average Impairment as a % of Total Assets Lagged one Quarter	Average Impairment as a % of Total Assets
2002	1	3445	15	1.02%	-34.91	6.85%	11.21%
2002	2	3576	54	3.48%	-335.39	8.79%	15.59%
2002	3	3543	69	4.21%	-150.85	8.51%	15.13%
2002	4	3500	190	9.62%	-376.38	9.24%	13.48%
2003	1	3484	14	0.81%	-101.85	7.91%	3.86%
2003	2	3617	38	2.09%	-97.76	5.47%	6.77%
2003	3	3572	39	2.08%	-172.85	6.02%	13.63%
2003	4	3516	106	5.15%	-69.62	4.73%	6.05%
2004	1	3465	18	0.97%	-29.27	2.12%	2.47%
2004	2	3567	29	1.51%	-16.88	9.13%	13.52%
2004	3	3532	35	1.78%	-161.27	7.34%	10.12%
2004	4	3470	91	4.27%	-282.85	3.64%	4.40%
2005	1	3445	10	0.53%	-18.62	3.25%	4.01%
2005	2	3580	24	1.16%	-59.86	6.20%	7.87%
2005	3	3515	33	1.58%	-40.36	4.94%	6.75%
2005	4	3451	110	5.19%	-128.84	4.45%	5.57%
2006	1	3403	15	0.72%	-144.21	1.87%	0.92%
2006	2	3497	28	1.39%	-88.81	9.45%	15.12%
2006	3	3450	36	1.78%	-71.86	5.30%	7.40%
2006	4	3351	115	5.40%	-57.46	3.89%	4.92%
2007	1	3315	13	0.63%	-13.02	1.07%	1.15%
2007	2	3353	33	1.61%	-93.33	2.74%	3.08%
2007	3	3283	41	2.07%	-129.36	3.63%	6.61%
2007	4	3186	137	6.93%	-345.71	6.13%	7.87%
2008	1	3140	22	1.10%	-522.03	7.85%	10.10%
2008	2	3204	70	3.58%	-229.48	8.97%	12.33%
2008	3	3159	131	6.82%	-321.57	12.88%	15.27%
2008	4	3107	532	27.86%	-302.04	10.97%	16.59%
2009	1	3096	88	4.94%	-104.96	8.83%	12.53%
2009	2	3219	122	7.40%	-192.06	8.01%	11.06%
2009	3	3172	77	4.46%	-93.52	4.09%	4.83%
2009	4	3102	174	9.43%	-60.08	4.74%	6.08%

Table II: Descriptive Statistics for Goodwill Impairments (continued)

Fiscal Year	Quarter	Number of Firms	Number of Firms With Goodwill Impairments	% of Firms with Goodwill that have Impairments	Average Impairment Amount for Firms with Impairments	Average Impairment as a % of Total Assets Lagged one Quarter	Average Impairment as a % of Total Assets
2010	9	3071	13	0.78%	-146.71	1.15%	1.22%
2010	7	3144	30	1.84%	-125.06	5.35%	9.01%
2010	7	3098	42	2.40%	-52.96	4.39%	5.35%
2010	3	3030	117	6.39%	-44.75	2.95%	3.32%
2011	9	2990	12	0.67%	-133.73	1.37%	1.56%
2011	1	3127	29	1.66%	-142.92	3.62%	4.37%
2011	8	3082	60	3.45%	-180.75	8.89%	12.35%
2011	9	3016	150	8.45%	-91.27	3.33%	4.27%
2012	6	2993	13	0.72%	-90.38	1.19%	1.33%
2012	4	3202	47	2.66%	-149.50	5.71%	7.89%
2012	1	3161	64	3.84%	-224.83	12.46%	9.25%
2012	3	3117	162	8.97%	-331.68	3.99%	5.05%
2013	3	3105	17	0.94%	-89.37	3.64%	4.12%
2013	8	3279	36	2.19%	-30.22	4.02%	4.67%
2013	2	3232	54	3.15%	-101.75	2.56%	2.73%
2013	3	3182	134	7.20%	-86.74	2.55%	3.05%
2014	6	3162	14	0.75%	-21.08	0.76%	0.77%
2014	1	3253	39	2.26%	-40.65	2.84%	3.21%
2014	3	3207	54	2.91%	-101.26	5.57%	8.22%
2014	4	3139	149	7.69%	-97.60	3.72%	4.60%
2015	4	3114	28	1.48%	-40.81	2.27%	2.93%
2015	9	3224	59	3.06%	-72.19	3.55%	4.33%
2015	7	3159	96	5.08%	-149.78	5.68%	7.68%
2015	1	3104	205	10.95%	-158.61	4.65%	5.93%
2016	4	3086	37	1.97%	-90.88	3.20%	3.62%
2016	7	3097	61	3.36%	-144.77	6.27%	7.46%
2016	6	3046	68	3.72%	-75.68	3.15%	3.74%
2016	2	2980	155	8.51%	-62.08	3.82%	4.74%
2017	4	2943	20	1.06%	-27.60	1.52%	1.59%
2017	8	2956	44	2.32%	-194.97	3.81%	4.45%
2017	8	2864	78	4.33%	-100.73	4.90%	5.52%
2017	6	2217	131	8.04%	-158.41	2.91%	3.32%

Table III: CAR Results Post Impairment

This table shows the mean and median CARs for all firms taking goodwill impairment write-offs from fiscal years 2002 -2017. Firms must be U.S. firms listed on the NYSE, AMEX, or NASDAQ stock exchanges. Financial firms and utilities are excluded. The impairment write-off event is defined as a two day window, day 0-1. The post results are from day 2-127 and day 2-252. Statistical significance of the mean and median are shown by stars with three stars representing significance at the 1% level, two stars 5% , and 1 star 10%. The median significance is based on a signed rank test. Both panels use a market-adjusted model to obtain abnormal returns.

Panel A: Value Weighted

CAR Period	Total Number of Days	Number of Observations	Mean	t-stat		Median		Standard Deviation
2-127	125	4476	0.1444	20.01	***	0.0736	***	0.4830
2-252	250	4476	0.2272	22.92	***	0.1242	***	0.6633

Panel B: Equal Weighted

CAR Period	Total Number of Days	Number of Observations	Mean	t-stat		Median		Standard Deviation
2-127	125	4476	0.0931	13.75	***	0.0415	***	0.4531
2-252	250	4476	0.1501	16.17	***	0.0740	***	0.6211

Table IV: CARs Sorted by Relative Impairment Size

This table shows the mean and median CARs for all firms taking goodwill impairment write-offs from fiscal years 2002 -2017. Firms must be U.S. firms listed on the NYSE, AMEX, or NASDAQ stock exchanges. Financial firms and utilities are excluded. The impairment write-off event is defined as a two day window, day 0-1. The post results are from day 2-127 and day 2-252. The CARS are sorted by the size of the impairment scaled by total assets lagged one quarter. The impairment size is sorted into 5 quintiles and each firm is assigned a quintile. Quintile 1 has the smallest impairment amounts and quintile 5 has the largest impairment amounts. Statistical significance of the mean and median are shown by stars with three stars representing significance at the 1% level, two stars 5% , and 1 star 10%. The median significance is based on a signed rank test. Both panels use a market-adjusted model to obtain abnormal returns.

CAR Period	Impairment Size Quintile	Total Number of Days	Number of Observations	Mean	t - Stat		Median		Standard Deviation
2-127	1	125	896	0.0307	3.28	***	0.0238	***	0.2795
2-127	2	125	895	0.0565	4.75	***	0.0347	***	0.3563
2-127	3	125	895	0.1144	7.89	***	0.0667	***	0.4339
2-127	4	125	895	0.2218	12.38	***	0.1247	***	0.5358
2-127	5	125	895	0.2989	13.55	***	0.1964	***	0.6600
2-252	1	250	896	0.0604	4.78	***	0.0509	***	0.3781
2-252	2	250	895	0.1159	6.59	***	0.0735	***	0.5262
2-252	3	250	895	0.1790	9.31	***	0.1074	***	0.5749
2-252	4	250	895	0.3153	12.62	***	0.1798	***	0.7475
2-252	5	250	895	0.4656	15.72	***	0.3142	***	0.8864

Table V: CARs Sorted by Up Market versus Down Market

This table shows the mean and median CARs for all firms taking goodwill impairment write-offs from fiscal years 2002 -2017. Firms must be U.S. firms listed on the NYSE, AMEX, or NASDAQ stock exchanges. Financial firms and utilities are excluded. The impairment write-off event is defined as a two day window, day 0-1. The post results are from day 2-127 and day 2-252. The CARS are sorted by the status of the market, up or down at the time the event is made public. Statistical significance of the mean and median are shown by stars with three stars representing significance at the 1% level, two stars 5% , and 1 star 10%. The median significance is based on a signed rank test. Both panels use a market-adjusted model to obtain abnormal returns.

CAR Period	Market Status	Total Number of Days	Number of Observations	Mean	t -Stat		Median		Standard Deviation
2-127	Up	125	3743	0.1053	15.16	***	0.0593	***	0.4252
2-252	Up	250	3743	0.1677	17.60	***	0.0985	***	0.5831
2-127	Down	125	733	0.3440	13.82	***	0.2360	***	0.6739
2-252	Down	250	733	0.5310	15.67	***	0.3488	***	0.9171

Table VI: CARs Sorted by Up Market versus Down Market and Impairment Size

This table shows the mean and median CARs for all firms taking goodwill impairment write-offs from fiscal years 2002 -2017. Firms must be U.S. firms listed on the NYSE, AMEX, or NASDAQ stock exchanges. Financial firms and utilities are excluded. The impairment write-off event is defined as a two day window, day 0-1. The post results are from day 2-127 and day 2-252. The CARS are sorted by the status of the market, up or down at the time the event is made public and by the relative impairment size based on quintiles. Quintile 1 is the smallest impairment and quintile 5 is the largest. Statistical significance of the mean and median are shown by stars with three stars representing significance at the 1% level, two stars 5% , and 1 star 10%. The median significance is based on a signed rank test.

CAR Period	Market Status	Impairment Size Quintile	Total Number of Days	Number of Observations	Mean	t - Stat		Median		Standard Deviation
2-127	Up	1	125	817	0.0322	3.47	***	0.0229	***	0.2646
2-127	Up	2	125	792	0.0436	3.67	***	0.0305	***	0.3340
2-127	Up	3	125	758	0.0870	6.19	***	0.0611	***	0.3872
2-127	Up	4	125	724	0.1716	9.30	***	0.1014	***	0.4965
2-127	Up	5	125	652	0.2198	9.66	***	0.1397	***	0.5812
2-127	Down	1	125	79	0.0152	0.33		0.0516		0.4044
2-127	Down	2	125	103	0.1559	3.26	***	0.0658	***	0.4857
2-127	Down	3	125	137	0.2656	5.07	***	0.1530	***	0.6130
2-127	Down	4	125	171	0.4343	8.93	***	0.3281	***	0.6362
2-127	Down	5	125	243	0.5111	9.97	***	0.3943	***	0.7990

CAR Period	Market Status	Impairment Size Quintile	Total Number of Days	Number of Observations	Mean	t - Stat		Median		Standard Deviation
2-252	Up	1	250	817	0.0588	4.69	***	0.0514	***	0.3586
2-252	Up	2	250	792	0.0965	5.43	***	0.0699	***	0.5002
2-252	Up	3	250	758	0.1320	7.04	***	0.0881	***	0.5164
2-252	Up	4	250	724	0.2479	9.75	***	0.1355	***	0.6839
2-252	Up	5	250	652	0.3432	11.32	***	0.2325	***	0.7739
2-252	Down	1	250	79	0.0762	1.25		0.0460	*	0.5431
2-252	Down	2	250	103	0.2655	3.97	***	0.2092	***	0.6790
2-252	Down	3	250	137	0.4392	6.59	***	0.2475	***	0.7797
2-252	Down	4	250	171	0.6008	8.53	***	0.4570	***	0.9207
2-252	Down	5	250	243	0.7939	11.58	***	0.5370	***	1.0689

Table VII: Regressions of CAR Data on Explanatory Variables

This table shows the coefficient estimates for the explanatory variables used in a regression with the CARs. Panel A shows the results for the 6 month CARS and panel B for the 1 year CARs. The t-stats are shown in parenthesis. Statistical significance is denoted by stars with three stars denoting 1%, two stars 5% and 1 star 10%.

Panel A

	Six month CAR results		
Intercept	0.1282**	-0.0018	-.0001
	(2.33)	(-.03)	(0.00)
Down market	0.1195***	.0864***	.0862***
	(4.84)	(3.62)	(3.61)
Impairment Size		.0509***	.0503***
		(9.47)	(9.23)
Market Cap(M$)			-1.89E-10
			(-1.04)
R^2	1.98%	4.22%	4.22%
Number of Observations	4476	4476	4476
Industry Fixed Effects	YES	YES	YES

Panel B

	One Year CAR results		
Intercept	0.1386*	-0.0863	-0.0806
	(1.79)	(-1.11)	(-1.03)
Down market	0.3583***	.3010***	.3002***
	(10.14)	(8.86)	(8.83)
Impairment Size		.0880***	.086***
		(11.89)	(11.51)
Market Cap(M$)			-.0000**
			(-2.39)
R^2	5.59%	8.71%	8.74%
Number of Observations	4476	4476	4476
Industry Fixed Effects	YES	YES	YES

Table VIII: BHARs

This table shows the mean and median BHARs for all firms taking goodwill impairment write-offs from fiscal years 2002 -2017. Firms must be U.S. firms listed on the NYSE, AMEX, or NASDAQ stock exchanges. Financial firms and utilities are excluded. The impairment write-off event is defined as a two day window, day 0-1. The post results are from day 2-127 and day 2-252. Statistical significance of the mean and median are shown by stars with three stars representing significance at the 1% level, two stars 5% , and 1 star 10%. The median significance is based on a signed rank test. The abnormal BHAR is the BHAR of the event firm minus the BHAR of the value-weighted market return for the same time period.

BHAR Period	Total Number of Days	Number of Observations	Mean	t - Stat		Median		Standard Deviation
2-127	125	4501	0.1741	14.83	***	0.0333	***	0.7877
2-252	250	4501	0.3123	15.02	***	0.0460	***	1.3950

Table IX: BHARs Sorted by Up Market versus Down Market

This table shows the mean and median BHARs for all firms taking goodwill impairment write-offs from fiscal years 2002 -2017. Firms must be U.S. firms listed on the NYSE, AMEX, or NASDAQ stock exchanges. Financial firms and utilities are excluded. The impairment write-off event is defined as a two day window, day 0-1. The post results are from day 2-127 and day 2-252. The BHARS are sorted by the status of the market, up or down at the time the event is made public. Statistical significance of the mean and median are shown by stars with three stars representing significance at the 1% level, two stars 5% , and 1 star 10%. The median significance is based on a signed rank test. The abnormal BHAR is the BHAR of the event firm minus the BHAR of the value-weighted market return for the same time period.

BHAR Period	Market Status	Total Number of Days	Number of Observations	Mean	t -Stat		Median		Standard Deviation
2-127	Up	125	3765	0.1208	11.14	***	0.0175	***	0.6655
2-252	Up	250	3765	0.2391	12.09	***	0.0288	***	1.2135
2-127	Down	125	736	0.3117	9.22	***	0.0929	***	0.9171
2-252	Down	250	736	0.5669	8.19	***	0.0771	***	1.8785