TRIGGER WARNINGS: WHEN IS GOODWILL IMPAIRMENT DISCLOSURE INFORMATIVE?

Maria Nykyforovych

A dissertation submitted to the faculty of the University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the Department of Accounting.

Chapel Hill
2017

Approved by:

Jeffery Abarbanell

Wayne Landsman

Gregory Brown

Edward Maydew

Bradley Hendricks

Jeffrey Hoopes

ABSTRACT

MARIA NYKYFOROVYCH: Trigger Warnings: When Is Goodwill Impairment Disclosure Informative?
(Under the direction of Jeffery Abarbanell)

This paper examines the information content of financial statement disclosures related to goodwill impairment testing after the implementation of the Statement of Financial Accounting Standards (SFAS) 142. I hand-collect a sample of triggering events that firms disclose at the time of a goodwill impairment announcement. Factor analysis reveals that impairment reasons group into three categories: firm-, industry- or economy-related. I find significant price and volume market reactions to a firm's decision to impair goodwill, but only if a firm discloses firm-specific triggering events. This result may explain previous mixed evidence on market reactions to goodwill impairment announcements that do not account for the triggering event cited by the firm. Additional findings indicate that consistent with the predictions of Kim and Verrecchia (1994), firm-specific triggering events increase the post-announcement information asymmetry, and predict future goodwill impairments when a firm records multiple impairments. Overall, these results indicate that financial statement users require more detailed firm-specific disclosures related to goodwill impairment testing. The SEC and FASB might consider this finding while developing future disclosure guidance for financial statement filers.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1
INTRODUCTION

This paper investigates the information content of disclosures related to goodwill impairment testing under the Statement of Financial Accounting Standards (SFAS) 142 regime. At the time SFAS 142 was issued (2001) the Financial Accounting Standards Board (FASB) noted that intangible assets are an increasingly important economic resource for many entities and are an increasing proportion of the assets acquired in many transactions. As a result, better information about intangible assets was needed (FASB (2001), p.3). While extensive research analyzing the consequences of SFAS 142 adoption exists, none of the papers to date have looked into firms' detailed goodwill impairment-related disclosure and financial statement users' reaction to such disclosure. This paper seeks to fill this void.

Aside from a discussion of SFAS 142 effectiveness, the study of goodwill impairments represents an interesting area of research for a number of reasons. First, both the magnitude and the frequency of goodwill impairments increased substantially, suggesting that it is an economically significant set of events. Second, goodwill impairments are charged against net income, creating a complex event response system from managers, investors, analysts and other financial statement users. Third, goodwill is an inherently hard-to-evaluate asset because of considerable managerial discretion with regards to the impairment recognition timing and amount. This study aims to shed new light on the issues of SFAS 142 disclosure informativeness and goodwill impairment causes and consequences.

SFAS 142 is a highly controversial standard. On one hand, standard setters argue that, on average, SFAS 142 disclosures allow managers to convey private information on a firm's future cash flows. Critics, on the other hand, argue that firm managers may use discretion afforded by the

standard to manage financial reports opportunistically. Moreover, in addition to the points raised by proponents and critics of SFAS 142, it is possible that the required disclosures may not be useful to investors or may be pre-empted by information available through other sources during the time periods that precede goodwill impairment announcements.[1] Empirical literature reports mixed results on the market reaction to goodwill impairments.[2] Ramanna and Watts (2012) note that while SFAS 142 might be net beneficial, they do not find any evidence to this effect. By presenting descriptive as well as quantitative evidence on the effects of SFAS 142 adoption, this paper takes an overarching approach in assessing the standard and informs the debate surrounding the issue of goodwill impairment testing and reporting.

First, I examine whether the market reacts to an additional detailed goodwill impairment-related disclosure mandated by SFAS 142. I find that the market reaction differs depending on the type of a triggering event cited by the firm at the time of a goodwill impairment announcement. Furthermore, in addition to a stock return measure of information content used in prior studies, I employ an abnormal trading volume measure (Beaver (1968)). Changes in price indicate the average change in investors' beliefs while trading volume reflects idiosyncratic reactions to the announcement. This approach captures changes in expectations of individual investors in response to a firm's public disclosures, a market response that is not reflected in various return-based measures of information content employed by previous studies in this area.[3] Again I find that results differ, depending on the triggering event. These findings may explain previous mixed evidence on market reactions to goodwill announcements that did not account for the triggering events disclosed by firms at the time of goodwill impairment recognition.

[1]For example, if managers report opportunistically, consistent with critics' concerns, then additional goodwill impairment disclosures result in release of distorted information to which the market does not respond. Alternatively, the market might see through the information distortion, making required disclosures uninformative.

[2]Francis et al. (1996) find no significant market reaction to goodwill impairments, while Hirschey and Richardson (2002) report negative market reaction. Bens et al. (2011) find a decrease in the information content under the SFAS 142 regime; Li and Sloan (2015) conclude that SFAS 142 did not change the information content of goodwill impairment announcements.

[3]Chen et al. (2008) use return-earnings regressions to assess the impact of goodwill announcements on firm stock returns. Bens et al. (2011), Li et al. (2011), Li and Sloan (2015) estimate abnormal stock returns, Hirschey and Richardson (2002) and Knauer and Wohrmann (2016) calculate cumulative abnormal returns to draw inferences.

Second, I find that firm-specific goodwill impairment disclosure helps predict future goodwill write-downs for firms that record multiple impairments. These results lend support to FASB's assertion that SFAS 142 provides financial statement users with better understanding of changes in goodwill over time, thereby improving their ability to assess a firm's future profitability and cash flows. Moreover, this finding suggests that when the SEC requests additional information about goodwill impairment testing, it should encourage filers to disclose more firm-specific information about how economic events affect the firm rather than provide a blanket discussion of the economy- and/or industry-level developments.

Finally, I analyze changes in information asymmetry around public disclosures about goodwill write-downs. I find evidence consistent with the predictions of Kim and Verrecchia (1994) that suggests that public disclosures of detailed goodwill impairment information induce post-announcement information acquisition by sophisticated investors, which increases information asymmetry immediately after the disclosure is made and leads to a differential interpretation of firm value. Additional tests demonstrate that XBRL introduction amplified this effect, consistent with findings of Blankespoor et al. (2014) that a reduction in investors' data aggregation costs may not serve its intended purpose of leveling the informational playing field. Thus, SFAS 142-mandated disclosures benefit larger investors that are able to leverage their superior resources and abilities to gain further trading advantages from public disclosures, consistent with increased concerns of adverse selection.

In order to conduct the analysis described above, I examine SEC filings on interim annual (quarterly) impairment tests and collect goodwill impairment-related disclosures such as triggering events, valuation methods, use of third-party valuators etc. After combining the hand-collected data with other datasets providing relevant controls from prior literature, the resulting final sample consists of 227 firms with 472 reported goodwill write-downs. Consistent with firms having extensive variation in the types of triggering events producing impairments, I identify 16 distinct triggering event categories.[4] Industry-specific factors, poor past operational performance and

[4]A full list of triggering events is presented in Table 1.1.

expectation of lower future performance represent the most frequently cited impairment indicators. This observation is in contrast to the SEC position that considers the decline in market capitalization as a leading triggering event for goodwill impairment testing. According to the EY report (EY (2016), p.104), the SEC frequently challenges firms' decisions not to impair goodwill after a significant decline in company's market capitalization. Additionally, I observe that 36 companies choose not to disclose any information related to their goodwill impairment decision, even though SFAS 142 specifically requires firms to make such disclosures available in their financial statements.

I first analyze the information content of earnings announcements that disclose a goodwill impairment. I compare the information content of earnings announcements across three categories of firms: firms that make a joint goodwill impairment and earnings announcement; firms that have a positive goodwill balance but do not record a goodwill write-down at the time of the earnings announcement; and firms with a zero goodwill balance. I conduct univariate comparisons followed by multivariate analysis that includes controls for time trends and other variables that prior literature identifies as having an influence on abnormal return volatility and trading volume. I find that compared to earnings announcements by non-goodwill-impairing firms, joint announcements of goodwill impairments and earnings result in a greater increase in abnormal return volatility and abnormal trading volume, indicating higher information content. Additionally, I find that firms with positive goodwill balances, both goodwill-impairing and non-impairing, experience a higher market reaction to earnings announcement news than do firms with zero goodwill balances. This result suggests that news about a non-impairment by positive goodwill firms bears information content as reflected by abnormal return volatility and abnormal trading volume measures. I compare this result to earnings announcement market reactions that positive goodwill and zero goodwill firms experienced before SFAS 142 introduction. Results indicate that, on average, zero goodwill firms experienced higher market reactions to quarterly earnings announcements than positive goodwill firms. This finding suggests that SFAS 142 potentially altered the information environment around the earnings news release, resulting in significant change in the market reaction for firms with positive goodwill balances.

Next, I analyze whether the market reaction to goodwill impairments differs depending on the category of a triggering event cited by a firm at the time of a goodwill write-down announcement. In addition, I re-estimate the above relation combining the 16 triggering event variables into three factors using exploratory factor analysis. Two factors group triggering events more commonly associated with firm-level event disclosures. The remaining factor captures triggering events more closely aligned with economy-wide or industry-level event types. I find that while some triggering events are associated with changes in abnormal returns and trading volume, others experience significant associations with only one or neither of the above measures. For example, a decline in market capitalization does not result in significant announcement changes in abnormal return volatility or abnormal trading volume. Intuitively, this is explained by the fact that changes in stock price are easily observable in periods that precede the goodwill impairment announcement. Thus, efficient market prices already reflect this information resulting in an insignificant goodwill write-down market reaction. On the other hand, the disclosure of a firm-specific triggering event like major customer loss is related to a significant abnormal return volatility and, to a lesser extent, abnormal trading volume, indicating an adjustment of the market's prior expectations about a firm in response to new information. In line with the results of tests examining the individual triggering events, I find that the two factors tied to the firm-level goodwill impairment-related disclosure are significantly and positively associated with increases in abnormal return volatility and abnormal trading volume, while the factor linked with economy and industry-level impairment disclosure does not have a statistically significant effect on these two outcomes in most regression specifications. Overall, the results from both sets of tests confirm my prediction that the market response to goodwill impairment disclosures differs depending on the triggering event type.

An alternative/coincidental explanation for the market reaction to goodwill write-downs is the level of information asymmetry among trades that exist before and after the public news release. To explore how information asymmetry may affect observed market reactions to goodwill impairments I examine changes in bid-ask spreads and stock liquidity around goodwill impairment announcement dates. My findings are generally consistent with the predictions of Kim and Verrecchia (1994)

that disclosure of financial accounting information can induce post-announcement information acquisition by sophisticated investors, which increases information asymmetry and/or differential interpretations of firm value.

In my final set of tests, I examine whether past triggering events have predictive power to assess future goodwill impairment probability for firms with multiple impairments. More than half of the firms in the hand-collected sample recorded multiple goodwill impairments after the introduction of SFAS 142. Exploiting this fact, I employ an extension of a proportional hazard model that takes into account time-varying covariates and a possibility of multiple impairments by the same company. I predict that if triggering event disclosures provide additional useful information to investors in assessing future performance of the firm (particularly in the realm of its goodwill), then impairments in the current period are likely to be indicative of potential future impairments. Consistent with this prediction, I find that firm-level triggering events such as competition, major customer loss or new legislation/regulation are significantly positively associated with a hazard of subsequent goodwill impairment recognition. Disclosure of triggering events related to one of the two firm-specific information factors also indicates a shorter time to the next impairment. This test provides additional evidence that the enhanced disclosure detail required by SFAS 142 provides financial statement users with incremental information that is relevant for assessing future goodwill-related outcomes.[5]

This paper contributes to the literature in several ways. The first is the literature on intangible assets, to which this study contributes by providing evidence that disclosure of fair value estimates and details surrounding intangible assets' valuation process lead to more informative prices, but only if firms provide firm-specific disclosures of facts and circumstances that directly affect fair values of such assets. Additionally, this paper provides initial evidence that SFAS 142 altered earnings announcements market response for firms with positive goodwill balances. Before SFAS 142 was implemented zero goodwill firms, on average, experienced a higher market reaction to earnings announcements than positive goodwill firms. After the adoption of the new standard, however,

[5]This is in contrast to the findings of Hayn and Hughes (2006). Analyzing single impairments that follow goodwill-creating mergers or acquisitions, they find that the amount and quality of goodwill impairment disclosures do not allow investors to effectively evaluate the appropriateness of management determinations regarding goodwill write-downs.

positive goodwill firms experience consistently stronger earnings announcement market responses, suggesting that the absence of a goodwill impairment in the earnings announcement also conveys news to the market.

The second stream of literature is that on real consequences of accounting regulation. This study informs the debate on the market impact of SFAS 142, a highly controversial standard. I demonstrate that the market response magnitude differs depending on a type of triggering events disclosed by a firm at the time of a goodwill impairment decision. Firm-specific disclosures consistently demonstrate higher information content over the economy- and industry-related discussions. This result suggests that financial statement users require more detailed firm-specific disclosures related to goodwill impairment testing and write-down recognition. The SEC and FASB might consider this finding while developing future disclosure guidance for financial statement filers. As for the empirical literature, this result may explain previous mixed findings that indicated weak or almost non-existent market reaction to goodwill impairment announcements. The degree of market response may vary depending on a sample composition in terms of time period, industry representation and/or underlying triggering events distribution.[6] Furthermore, I contribute to the literature that studies determinants of goodwill impairments by demonstrating that if a firm records multiple goodwill impairments, certain past triggering events affect the probability of subsequent goodwill write-downs by the same firm. This finding lends support to FASB's assertion that SFAS 142 provides financial statements users with better understanding of changes in goodwill over time, thereby improving their ability to assess a firm's future profitability and cash flows.

The remainder of this paper is structured as follows. Section 2 discusses previous research and develops testable hypotheses. Data sources and data collection procedure is described in Section 3. Section 4 discusses methodology employed in this study, while Section 5 reviews sample descriptive statistics and empirical results. Section 6 concludes.

[6]The use of alternative market reaction measures (cumulative abnormal returns (CARs), buy-and-hold returns (BHARs)) does not alter these results. For a discussion of measures of information content employed in this study see Section 2.2.1.

Table 1.1: Examples of Triggering Event Disclosures in Firms' Financial Statements

Triggering Event	Example from annual (quarterly) reports	N
Economic factors (including global recession)	Due to the current weak economy, we have incurred a net loss in 2009 of $15.0 million, which includes a pre-tax goodwill impairment charge of $17.1 million.	97
Industry-specific factors	In the second quarter of 2008, the Company revised its full year operating income and cash flow expectations and revised its long-term forecast of the U.S. home products market. Primarily due to the impact of a worse than anticipated decline in the U.S. home products market on financial results, the Company concluded it was necessary to conduct an interim goodwill impairment test of reporting units. Based on the results of the testing, the Company recorded pre-tax goodwill impairment charges of $288.9 million (both before and after tax)	114
Decline in market capitalization	For 2008, the conclusion was due to the deterioration in the price of our common stock and the resulting reduced market capitalization.	82
Poor operational performance	This write down is attributable to Legacy's past and continuing operating losses.	126
Expectation of lower future performance	In 2004, the U.S. Generics business determined its goodwill was impaired due to significantly lower expectations for new product profitability.	144
Competition	As part of the required annual impairment test, the entire goodwill of Animal Health was written off resulting in a charge of $66.0 million. New competitive entrants resulted in lower forecasted cash flows.	21
Major customer loss	In February of 2005, the Company was notified that its contract with USPS for polycarbonate and Aluminum CBUs would not be renewed. After the loss of the contract, management concluded that the fair value of the Company was not in excess of the carrying value of the underlying tangible assets, indicating that there is no longer value attributable to goodwill.	17

(Table 1.1 continues on the next page)

(Table 1.1 continues from the previous page)

Triggering Event	Definition	N
Asset sale/expectation of sale/-closure	In September 2008, the Company sold its entire 72.86% interest in NanoPhotonics AG. The Company recorded an impairment charge of €1,395 related to goodwill of its investment in NanoPhotonics AG in June 2008.	44
New legislation or regulation	In the second quarter of 2010, we assessed our Americas region goodwill for impairment. In our assessment, we evaluated the impact on the segment's fair value due to the Macondo Incident, the resulting oil spill and the drilling moratorium. Based on the factors discussed above, which were incorporated into our evaluations and testing as prescribed under U.S. GAAP, we determined that an impairment of our Americas region goodwill existed, and accordingly we recorded a $97.7 million impairment charge as of June30, 2010, reflecting all of our Americas region goodwill. The non-cash charge does not impact our liquidity or debt covenant compliance.	10
Rising costs	Upon performing our annual goodwill impairment test in the fourth quarter of 2011, a goodwill impairment charge of $27.8 million was recorded driven by increases in our anticipated costs to bring the Lower War Eagle mine into production.	14
Strategic change	The impairment charge recognised in 2007 relates to the Group's business in China. The Group's strategy relating to China was revised in the first half of 2007 with a change in focus to concentrate on key brands and streamline the distribution network which led to the impairment of goodwill historically recognised.	12
Currency issues/exchange rates	During the third quarter of fiscal 2005, CAE's Management initiated a comprehensive review of current performance. This review revealed that several factors have emerged and/or worsened over the course of the past year, including the appreciation of canadian dollar.	5

(Table 1.1 continues on the next page)

(Table 1.1 continues from the previous page)

Triggering Event	Definition	N
Restatement to previous impairment	Because of the accounting misconduct identified in the forth quarter of 2012, goodwill was re-tested for impairment.	9
Other	While the Company made good faith projections of future cash flow in 2005, it failed to meet those projections in 2006 due to industry conditions and other factors. The Company believes certain of these factors will continue to have an impact in 2007 and late in 2006.	2
Compustat error	EDC also recorded a pre-tax, non-cash impairment charge of $11.2 million in the 2009 second quarter, representing the entire carrying value of EDC's trade names	244
Recognition after denial	We completed our annual impairment testing during the second quarter of fiscal 2008 and determined there was no impairment. In the fourth quarter of fiscal 2008 we identified a triggering event requiring us to evaluate the goodwill of the international segment for possible impairment. We performed an impairment analysis, which included a third-party valuation, and recorded an impairment charge of $26.0 million to write down goodwill to its estimated fair value.	22
Not disclosed	We completed our goodwill impairement testing and determined that our goodwill was fully impaired. We wrote down the entire goodwill balance.	36
Business restructuring	Goodwill in our Driveshaft segment was tested for impairment again at the end of the third quarter of 2008. For the September 30, 2008 valuation, we utilized cash projections based on updated five-year projections due to the operational efficiencies resulting from our reorganization initiatives.	8

This table presents examples of goodwill impairment-related disclosure in the financial statements of goodwill-impairing firms. For the hand-collected sample, N is a number of triggering events in each category. Sum of the number of triggering events exceeds the number of impairment observations in the hand-collected sample because firms can name several triggering events for one recorded goodwill impairment.

CHAPTER 2

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1 Related Literature

Substantial accounting literature analyzes asset write-downs and long-lived asset impairments, including those of goodwill. One stream of literature analyzes whether companies use goodwill impairments to manage earnings in the form of earnings smoothing or big bath accounting. Zucca and Campbell (1992) find that a majority of asset write-downs occur in periods with unexpectedly low earnings, consistent with big bath behavior. Furthermore, over a quarter of write-downs appeared to follow a pattern of income smoothing. Rees et al. (1996) find that companies tend to write down assets in periods when earnings are low relative to industry medians. Francis et al. (1996) report that asset impairments are less likely for companies with poor performance and with unusually good performance, the opposite of what would be expected if write-offs were motivated by big bath accounting and income smoothing. Riedl (2004) finds that post-SFAS 121 write-offs are less strongly associated with economic factors and more strongly associated with big bath accounting.

Several studies analyze whether managers respond to managerial or firm-level incentives and attempt to accelerate or delay impairments. One of the main concerns for managers that consider goodwill impairment recognition is that they may violate debt covenants that relate to the balance sheet or income statement key ratios. Beatty and Weber (2006) and Ramanna and Watts (2012) find that companies are less likely to write off goodwill if they face binding debt covenants. Studies by Francis et al. (1996), Beatty and Weber (2006) and Ramanna and Watts (2012) also demonstrate that managers are concerned about reputational effects of goodwill write-down recognition. Longer-

serving CEOs may be reluctant to write off goodwill because the losses may reflect negatively on the M&A transactions which they initiated in earlier periods, while new CEOs might be inclined to accelerate goodwill impairments to start their tenure with a clean slate. Beatty and Weber (2006) and Ramanna and Watts (2012) also find evidence that indicates that the likelihood of companies writing off goodwill is lower if their CEO's pay package includes a cash bonus.

Evidence on the market reaction to asset impairments is mixed. For example, Strong and Meyer (1987) found positive reactions to asset write-offs while Elliott and Shaw (1988) document a negative market response. Francis et al. (1996), examining several types of asset write-downs, find little to no market reaction to goodwill impairment announcements. On the other hand, Hirschey and Richardson (2002) document that the information effects narrowly tied to goodwill write-off announcements are typically negative and material, on the order of 2-3% of the company's stock price. Following SFAS 142 adoption several studies observe a decline in market reaction to goodwill announcements. For example, Bens et al. (2011) present exploratory evidence of a decrease in the information content of goodwill impairments manifested through a weakened (no change in) reaction to impairment announcements for the high (low) information asymmetry and larger (smaller) firms. The authors attribute their findings to the increasing complexities of applying SFAS 142 that results in an increased noise level of reported impairments.

This study is related to work by Li et al. (2011) and Bens et al. (2011) that explore the market reaction to goodwill write-downs announcements, the information content of goodwill impairments and determinants of goodwill write-off decisions. These studies look at all goodwill impairments as one homogeneous group, and do not take SFAS 142 mandated disclosures into consideration. Taking a different approach, I am able to categorize goodwill impairments into subgroups based on triggering events disclosed in firms' financial statements and analyze market reactions for each subgroup separately. Additionally, analysis of pre- and post-SFAS 142 market reaction to earnings/goodwill announcement is based on industry- and size-matched firms with positive or zero goodwill balances, and does not depend on the arbitrary determination of a firm's potential indicators of goodwill impairments that were not recognized in a timely manner.

Assessment of the predictive power of disclosures related to goodwill impairment testing and recognition relates to the work of Hayn and Hughes (2006). Analyzing single impairments that follow goodwill-creating mergers or acquisitions, they find that the amount and quality of goodwill impairment disclosures do not allow investors to effectively evaluate the appropriateness of management determinations regarding goodwill write-downs. In contrast to Hayn and Hughes (2006), I examine firms that report multiple goodwill impairments and assess the predictive power of triggering events disclosed at the time of the impairment announcement.

2.2 Hypotheses Development

2.2.1 Assessment of Information Content of SFAS-142-mandated Disclosures

Seminal papers by Ball and Brown (1968) and Beaver (1968) operationalize the concept of information content in the accounting literature. Beaver (1968) observes that information flow manifests itself through return and volume volatility around the announcement period. Changes in price indicate the average change in investors' beliefs while trading volume reflects idiosyncratic reactions to the announcement. Analytical models of trade posit that the price reaction to an information event is a function of the precision of the announced information relative to the average precision of investors' prior information and the surprise contained in the information signal plus noise. Based on the analytical model proposed by Kim and Verrecchia (1991), Atiase and Bamber (1994) note that predisclosure information asymmetry causes investors to form differential predisclosure expectations, which result in differential belief revisions when annual earnings are announced. These differential belief revisions, in turn, induce trading activity.

I hypothesize that the market reaction to a goodwill impairment depends on the nature of a triggering event that gave rise to the write-down. Real market effects of goodwill impairment announcements might be concealed if underlying triggering events are associated with share prices moving in the opposite directions. Moreover, Beaver (1968) posits that an important distinction between the price and volume tests is that the former reflects changes in the expectations of the

market as a whole while the latter reflects changes in the expectations of individual investors. Consequently, information released by a firm might be neutral in the sense of not changing the expectations of the overall market, manifesting in no price reaction. At the same time, if revealed information alters the expectations of individual investors, there would be shifts in portfolio positions reflected in the trading volume. Thus, a price-based measure of information content might be less sensitive to a goodwill announcement report than a volume-based measure. For example, a firm undergoing restructuring might release a restructuring plan well ahead of the earnings/goodwill announcement. In efficient markets this information will already be reflected in the stock price by the time a firm cites $Restructuring$ as a triggering event for a goodwill impairment. However, such disclosure might influence individual investors' expectations, resulting in significant changes in abnormal trading volume after the write-down announcement. Overall, I expect triggering events related to information publicly observable in prior periods to have less information content than triggering events that reveal private information of a firm's insiders as the former category implies less information asymmetry between the firm and the market than the latter category does.

Previous research (Francis et al. (1996), Riedl (2004)) generally classifies factors related to asset impairment decisions into economy-, industry- and firm-level categories. Intuitively, I argue that the economy- and industry-level information is readily available and easy to obtain, thus resulting in less information asymmetry and more homogeneous predisclosure investor expectations. Firm-level information, on the other hand, is scarcer and harder to acquire resulting in higher levels of predisclosure information asymmetry. Atiase and Bamber (1994) find that the greater the level of predisclosure information asymmetry, the greater the disclosure's effect on the investors' trading activity. Additionally, (Kothari (2001), p.115) notes that the use of the firm-specific component alone enhances the power of the tests of the information content of accounting reports. Based on these arguments, I formulate the following hypotheses:

H1: The market reaction to goodwill impairment announcements differs based on the underlying triggering event cited by the firm:

H1a: Firms that disclose firm-level triggering events experience higher abnormal stock return volatility than do firms that disclose triggering events related to economy- and industry-level information.

H1b: Firms that disclose firm-level triggering events experience higher abnormal stock trading volume than do firms that disclose triggering events related to economy- and industry-level information.

2.2.2 The Relation Between Impairment-Related Disclosures and Information Asymmetry

The primary motivation for hypotheses above relates to whether goodwill impairment disclosures have information content, depending on the type of triggering event. Another possibility is that information asymmetry systematically changes the flow and/or amount of informed trading that takes place around earnings/goodwill impairment announcement dates.

The relation between goodwill impairment-related disclosures and information asymmetry is an empirical question. Kim and Verrecchia (1994) present two ways to characterize public disclosure, each of which has different empirical implications. On one hand, public announcement may reduce information asymmetry in the economy where shareholders affiliated with the firm have superior information about the firm's performance based on their affiliation. In this case, public disclosure reveals private information held by informed traders to market makers. As a result, bid-ask spreads are wider for an extended period of time before the disclosure occurs and narrow immediately after the news release. Thus, market makers increase the bid-ask spread during the period of greatest information asymmetry (which also lowers liquidity) to protect against traders with superior information, and lower the spread when news reduces information asymmetry (and improves liquidity) (Kim and Verrecchia (1994), p.44). This leads to the following hypotheses:

H2: Bid-ask spreads increase and liquidity decreases prior to earnings announcements that include a goodwill impairment.

H3: The effect on bid-ask spreads and liquidity prior to earnings announcements is greatest when goodwill impairments are associated with firm-specific triggering events.

Alternatively, some sophisticated market traders ("market experts") acquire new private information in response to public goodwill impairment disclosures. These informed judgments, in turn, create information asymmetries between traders and market makers, resulting in higher bid-ask spreads and less liquid market as a direct *consequence* of more disclosure by the firm. Additionally, in this equilibrium the trading volume generated by market experts is greater than the volume they drive out, meaning that less liquidity does not translate into less trading activity around news announcements (Kim and Verrecchia (1994)). The preceding discussion leads to the following hypotheses:

H4: Bid-ask spreads increase and liquidity decreases after earnings announcements that include a goodwill impairment.

H5: The influence on bid-ask spreads and liquidity after earnings announcements is greatest when goodwill impairments are associated with firm-specific triggering events.

2.2.3 Do Current Impairment-Related Disclosures Relate to Subsequent Future Impairments?

Hayn and Hughes (2006) posit that the information content of goodwill impairment-related disclosure can be assessed through determination of the predictive power of items disclosed after SFAS 142 adoption. If information gained from the market and financial statements makes goodwill impairments fairly predictable, this suggests that market participants gain valuable information through SFAS 142 disclosures. Alternatively, lack of predictive power suggests that companies do not disclose sufficient information to provide users with a better understanding of the expectations about and changes in goodwill over time, as intended by FASB at the time of SFAS 142 release.

A different stream of goodwill impairment research documents that multiple goodwill impairments recorded by the same firm have become more frequent since the implementation of SFAS 142 (Li et al. (2011)). The hand-collected sample for this study confirms this finding: more than half of sample firms have 2 or more impairments during 2003-2013. I exploit this fact to assess whether

disclosures about previous goodwill impairments help predict future goodwill write-downs. This approach is different from previous research that studied predictive power of impairments based on acquisition characteristics (Hayn and Hughes (2006), Gu and Lev (2011)) and firm performance (Hayn and Hughes (2006), Li et al. (2011)).

I hypothesize that information about factors and circumstances that lead a firm to recognize one impairment might help in the evaluation of subsequent goodwill impairment probabilities. Therefore, I formulate the following hypothesis:

H6: Current goodwill impairment-related triggering events are associated with the likelihood of subsequent goodwill write-downs by the same firm.

The presence of significant associations between current triggering events and the likelihood of ensuing goodwill write-downs would indicate that financial statements provide information that helps gain a better understanding of a firm's subsequent performance, as intended by SFAS 142 (FASB (2001), p.4).

CHAPTER 3
DATA AND MEASUREMENT

3.1 Data Collection

Data sample for this study comes from multiple sources. I begin by identifying all quarterly goodwill impairment observations spanning years 2003-2013 in the Compustat database. For a randomly selected subsample of firms I hand-collect goodwill impairment-related disclosures from annual (quarterly) reports located at the Securities and Exchange Commission's EDGAR database website. Within the reports, information regarding goodwill impairment testing, triggering events and other SFAS 142-related disclosures are located in several different sections. Among them are the following: Risk factors; Management's discussion and analysis of financial condition and operations; Critical accounting policies and estimates; Significant accounting policies ; Footnotes on goodwill and other intangibles.

In the next step these data are merged with stock return data from CRSP database, CEO tenure and compensation data from Execucomp database, debt covenant violation risk data from Demerjian and Owens (2016) and earnings surprise and analyst following data from IBES. Macroeconomic control variables come from the Federal Reserve Economic Data (FRED) database of the Federal Reserve Bank of St.Louis. Additionally, some supplemental control variables are obtained from the Capital IQ database. Table 3.1 contains a full list of variable definitions and respective data sources.

I apply the following sampling procedure (see Table 3.2). First, I exclude observations that have missing annual and/or quarterly reports from the EDGAR database. Next, I drop observations that do not have sufficient information for variables of interest, ARVOL and ATVOL. In particular, I require at least 150 days of volume and return data before the goodwill impairment announcement (day 0) and 150 observations after the announcement. Additionally, I exclude firm-quarters with

daily volume and return data missing during the event period, i.e., days -1, 0 and +1. Finally, I drop observations that are incorrectly classified as goodwill impairments by Compustat. Hodder et al. (2013) provide examples of Compustat problems related to reported goodwill data and recommend hand collection of goodwill impairment-related disclosures as the only feasible way of ensuring data accuracy. Thus, I identify incorrect Compustat observations by studying each firm's annual and/or quarterly report that discusses SFAS 142-related procedures. I find that roughly 20% of the randomly selected goodwill impairment observations do not reflect respective firm disclosures. Typically, classification errors happen for the following reasons: (1) An asset other than goodwill is impaired. However, this asset write-down is classified as a goodwill impairment in Compustat. Impairments of radio broadcast licenses represent one example of such a misclassification; (2) An annual/quarterly report explicitly states that no goodwill impairments were recorded after SFAS-142 testing. However, Compustat goodwill impairment field for the respective quarter is populated.

Another potentially problematic data issue is related to Compustat-reported goodwill impairment magnitudes. In some instances reported goodwill write-down numbers represent a sum of impairments across several different asset types, both tangible and intangible. This issue is important in settings where goodwill impairment magnitude is used during sample construction (for example, only impairments that exceed a certain threshold are included in a sample). Additionally, these observations introduce noise to regression estimations that use goodwill write-down magnitude as a dependent variable. In my sample, I replace Compustat-reported numbers if correct goodwill impairment amounts could be traced in annual and/or quarterly reports. Otherwise, such observations are dropped from the analysis.

3.2 Goodwill Impairment Announcement Date

For the purposes of this paper, the goodwill announcement date is defined as a date of a quarterly earnings announcement (Compustat item RDQ) which coincides with a goodwill impairment announcement. To assess the reasonableness of this assumption, I turn to Capital IQ Key Developments section which tracks all major company events as they become publicly available

through various data sources, including company press-releases, conference calls, analyst forecast revisions etc. I randomly select 100 impairment observations from the hand-collected sample and compare Compustat goodwill announcement date to the earliest mention of the respective impairment in the Capital IQ's Key Developments section. I find that only 3 out of 100 impairments have a separate and earlier goodwill impairment announcement date than the joint earnings/goodwill announcement date from Compustat. Thus, it is unlikely that such announcement date discrepancies can significantly bias against the finding information content in goodwill impairments in this study.

3.3 Matched Samples

Simultaneous release of earnings and impairment news requires separation of market responses to these events. I perform a matching procedure based on the industry classification (2-digit SIC code) and company size (market capitalization) which results in the following 2 samples. The first sample consists of companies with positive goodwill balances but no goodwill impairments for at least a year before and after the goodwill announcement date by a matching goodwill-impairing firm. I refer to this sample as a positive goodwill sample. The second sample contains companies that, according to Compustat, have zero goodwill balance in every quarter during years 2003-2013. I refer to this sample as a zero goodwill sample. These firms serve as an alternative benchmark to a positive goodwill sample in that they represent a control for all earnings announcement news except for the possibility of an impairment. Therefore, all test results are reported for 3 groups of companies: goodwill-impairing firms, positive goodwill firms, and zero goodwill firms.

Table 3.1: Variable Definitions and Data Sources

Variable	Definition	Source of data
Return	Stock return for firm i in quarter of year t	CRSP
Bonus	Indicator equal to one if CEO compensation includes a bonus	ExecuComp
MngmtChange	Indicator equal to one if a firm underwent management change at year t	ExecuComp
DebtCovenant	Risk of debt covenant violation	Peter Demerjian's website
GDPChUS	Quarterly change in the United States Gross Domestic Product	Federal Reserve Bank of St.Louis
GDPChEU	Quarterly change in the European Union's Gross Domestic Product	Federal Reserve Bank of St.Louis
Will5000Ch	Quarterly change in Wilshire 5000 Total Market Full Cap Index. The Wilshire 5000 Total Market IndexSM is widely accepted as the definitive benchmark for the U.S. equity market, and measures performance of all U.S. equity securities with readily available price data. Named for the nearly 5,000 stocks it contained at launch, it then grew to a high count of 7,562 on July 31, 1998. Since then, the count fell steadily to 3,776 as of December 31, 2013, where it has then bounced back to 3,818 as of September 30, 2014. The last time the Wilshire 5000 actually contained 5,000 or more companies was December 29, 2005.	Federal Reserve Bank of St.Louis
VIXCh	Quarterly change in Chicago Board Options Exchange volatility index that measures market expectation of near term volatility conveyed by stock index option prices.	Federal Reserve Bank of St.Louis
GWDate	Goodwill impairment announcement date defined as (1) firm's quarterly earnings announcement date (2) first time when information about respective goodwill impairment appeared in the Capital IQ's Key Developments section	(1) Compustat (2) Capital IQ

(Table 3.1 continues on the next page)

(Table 3.1 continues from the previous page)

Variable	Definition	Source of data
TrigEvent	Goodwill impairment reason (triggering event) cited by the firm at the time of impairment announcement	Annual (quarterly) report of a respective firm
Size	Natural logarithm of market value of equity measured at the end of the quarter	Compustat
Leverage	Total liabilities scaled to total assets, both measured at quarter end	Compustat
RepLag	Reporting lag estimated as time from the quarter's end to the earnings/impairment announcement	Compustat
SUE	Standardized unexpected earnings at the quarter of a goodwill announcement	IBES
NumEst	Number of analysts following a firm during a quarter	IBES
RepLoss	Indicator variable equal to one if quarterly earnings per share are less than zero, and zero otherwise	IBES
ImpPrevQ	Indicator variable equal to one if there was a goodwill impairment recorded in the quarter immediately preceding the announcement quarter being analyzed; zero otherwise	Compustat
Recognition after denial	Indicator variable equal to one if a firm recognizes an impairment after initially denying it during previous 4 quarters, and zero otherwise	Annual (quarterly) report of a respective firm
Not disclosed	Indicator variable equal to 1 if a firm announces a goodwill impairment amount, but does not provide any further details about this decision; zero otherwise	Annual (quarterly) report of a respective firm
Zero GW	Industry- and size-matched firms that have zero goodwill balance for the duration of the sample	Compustat
Pos GW	Industry- and size-matched firms that have positive goodwill balance at least for one year before/after the event (goodwill announcement date of a goodwill impairment-announcing firm)	Compustat

Table 3.2: Sample Selection Procedure.

	Firm-Quarters	Firms
Available goodwill impairment observations (Compustat), 2003-2013	8159	4003
Obserations randomly selected	1631	620
Less		
CRSP return/volume information missing	393	92
Edgar annual/quarterly report missing	410	163
Compustat observations incorrecly classified as goodwill impairments	244	98
Compustat observations with incorrect goodwill impairment magnitudes	112	40
Final sample	472	227

Table 3.3: Descriptive Statistics for Impairment Firms

Variable	N	Mean	Std Dev	Minimum	25th Pctl	Median	75th Pctl	Maximum
Size	472	7220.930	14821.390	1.443	209.397	1246.440	5581.300	110190.060
Goodwill Balance	472	1884.320	4579.680	0.169	24.849	268.895	1676.250	36993.000
Goodwill Impairment	472	-325.917	1696.390	-26450.000	-106.228	-24.800	-4.008	-0.019
Number of Analysts	434	9.575	7.076	1.000	4.000	8.000	15.000	33.000
Reporting Lag	403	38.362	15.370	9.000	27.000	36.000	46.000	101.000
Leverage	470	2.003	1.349	0.791	1.287	1.649	2.168	13.933
Loss	402	0.231	0.422	0.000	0.000	0.000	0.000	1.000
SUE	403	0.116	1.978	-23.060	0.070	0.265	0.573	3.893
Bonus	472	0.193	0.395	0.000	0.000	0.000	0.000	1.000
CEO Tenure	296	5.081	6.139	0.000	1.000	3.000	7.000	36.000
Management Change	296	0.186	0.390	0.000	0.000	0.000	0.000	1.000
Debt Covenant	472	0.008	0.092	0.000	0.000	0.000	0.000	1.000
Quarters betw mult impair	349	9.868	11.009	0.000	2.000	4.000	16.000	42.000
Change in US GDP	472	0.392	3.577	-8.200	-1.900	1.350	2.800	6.900
Change in EUR GDP	472	-0.105	1.924	-4.456	-0.218	0.576	1.122	1.983
Market Return	472	1.169	9.377	-27.973	-7.677	3.980	8.331	12.718
Change in Volatility Index	472	-2.563	32.289	-39.212	-22.804	-9.072	3.459	133.746

This table presents descriptive statistics for the variables used in the estimations for goodwill-impairing firms. See Table 3 for detailed sample selection criteria used to generate dataset used in the study. All variables are defined in detail in Table 1.

Table 3.4: Descriptive Statistics for Non-Impairment Firms.

Panel A: Positive Goodwill Sample

Variable	N	Mean	Std Dev	Minimum	25th Pctl	Median	75th Pctl	Maximum
Size	424	6562.950	12586.710	3.653	262.202	1401.920	5901.450	84836.780
Goodwill Balance	424	1109.430	2616.960	0.075	20.734	138.928	787.294	22190.000
Number of Analysts	397	9.8295	7.5186	1.0000	4.0000	8.0000	14.0000	39.0000
Reporting Lag	372	34.763	13.473	15.000	25.000	32.000	40.000	91.000
Leverage	419	2.672	3.463	0.237	1.393	1.857	2.948	59.948
Loss	372	0.083	0.277	0.000	0.000	0.000	0.000	1.000
SUE	372	0.484	0.775	-3.407	0.123	0.335	0.644	8.720

Panel B: Zero Goodwill Sample

Variable	N	Mean	Std Dev	Minimum	25th Pctl	Median	75th Pctl	Maximum
Size	442	6917.820	5531.060	3.428	211.392	1500.031	5991.790	83880.570
Goodwill Balance	442	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Number of Analysts	369	8.7161	7.3935	1.0000	2.1538	7.0000	13.0000	31.0000
Reporting Lag	316	36.392	15.372	12.000	24.000	34.000	43.000	91.000
Leverage	440	4.320	12.861	0.318	1.562	2.508	4.521	257.154
Loss	316	0.266	0.442	0.000	0.000	0.000	1.000	1.000
SUE	316	0.224	0.605	-2.690	-0.020	0.135	0.436	4.933

This table presents descriptive statistics for the variables used in the estimations for size- and industry-matched positive goodwill and zero goodwill firms. All variables are defined in detail in Table 1.

Table 3.5: Sample Industry Composition. Top 25 SIC codes.

Industry	SIC	Number of Firms	Percent of Total
Electronic and Other Electrical Equipment (No Computer Equipment)	36	31	10.33
Chemicals and Allied Products	28	24	8.00
Engines and Turbines	35	23	7.67
Services-Advertising	73	16	5.33
Food and Kindred Products	20	14	4.67
Search, Detection, Navigation, Guidance, Aeronautical Systems	38	12	4.00
Radiotelephone Communications	48	11	3.67
Motor Vehicles and Passenger Car Bodies	37	10	3.33
Wholesale-Durable Goods	50	10	3.33
Pay Day Lenders	60	10	3.33
Electric, Gas and Sanitary Services	49	9	3.00
Papers and Allied Products	26	7	2.33
Newspapers: Publishing or Publishing and Printing	27	7	2.33
Crude Petroleum and Natural Gas	13	6	2.00
Steel Works, Blast Furnaces and Rolling and Finishing Mills	33	5	1.67
Metal Cans	34	5	1.67
Wholesale-Paper and Paper Products	51	5	1.67
Federal and Federally Sponsored Credit Agencies	61	5	1.67
Life Insurance	63	5	1.67
Real Estate	65	5	1.67
Services-Health Services	80	5	1.67
Household Furniture	25	4	1.33
Tires and Inner Tubes	30	4	1.33
Jewelry, Silverware and Plated Ware	39	4	1.33
Retail-Eating and Drinking Places	58	4	1.33

CHAPTER 4
METHODOLOGY

4.1 Measures of Abnormal Return Volatility and Abnormal Trading Volume

Consistent with previous research (Beaver (1968),Landsman et al. (2012)), I measure the volatility of stock returns at the time of goodwill impairment announcements as the ratio of the event window return volatility to the return volatility during the non-event period. First, I estimate the following daily market model-adjusted returns regression:

$$u_{it} = R_{it} - (a_i + b_i R_{mt}) \tag{4.1}$$

where R_{it} is the stock return of firm i for day t, R_{mt} is the market return for day t of the market capitalization-based decile that firm i belongs to. Firm i's market model parameter estimates a_i and b_i are calculated during the non-event period. The non-event period is defined as days t-150 to t-10 and t+10 to t+150 relative to the Compustat earnings announcement date, t=0.

Following DeFond et al. (2007) and Landsman et al. (2012), abnormal return volatility ($ARVOL$) is calculated as a natural log of a ratio of the mean of squared market model adjusted returns, u_{it}^2, to the variance of firm i's market model residuals during the non-event period, σ_i^2, where t=-1,0,+1 relative to announcement day 0.

$$ARVOL_i = ln\frac{u_{it}^2}{\sigma_i^2} \tag{4.2}$$

Abnormal trading volume ($ATVOL$) is defined as a natural log of a ratio of the mean of the event-period volume, V_{it}, to the average estimation-period volume, V_i (Landsman et al. (2012)):

$$ATVOL_{it} = ln\frac{V_{it}}{V_i} \tag{4.3}$$

Daily volume during the event announcement period, V_{it}, is shares of firm i traded during day t divided by shares outstanding of firm i for days t-150 to t-10 and t+10 to t+150 relative to the Compustat earnings announcement date, t=0.

4.2 Market Reactions to Earnings/Goodwill Announcements

I begin my test of whether abnormal return volatility and abnormal trading volume increase following a goodwill impairment announcement by estimating the following regression equations, by triggering event:

$$\begin{aligned} ARVOL_{it} = {} & \beta_0 + \beta_1 TrigEvent_{it} + \beta_2 Time_{it} + \beta_3 Size_{it} \\ & + \beta_4 NumEst_{it} + \beta_5 RepLag_{it} + \beta_6 Lev_{it} + \beta_7 Loss_{it} \\ & + \beta_8 SUE_{it} \end{aligned} \tag{4.4}$$

$$\begin{aligned} ATVOL_{it} = {} & \beta_0 + \beta_1 TrigEvent_{it} + \beta_2 Time_{it} + \beta_3 Size_{it} \\ & + \beta_4 NumEst_{it} + \beta_5 RepLag_{it} + \beta_6 Lev_{it} + \beta_7 Loss_{it} \\ & + \beta_8 SUE_{it} \end{aligned} \tag{4.5}$$

where ARVOL and ATVOL are abnormal return volatility and abnormal trading volume as defined in section 4.1, and i and t refer to firm and quarter-year, respectively. $TrigEvent$ is an indicator variable specifying a particular triggering event that was cited by a goodwill-impairing firm as a reason underlying the impairment decision in a particular quarter-year.

Additionally, following Landsman and Maydew (2002) and Landsman et al. (2012), I include various control variables identified as potentially affecting stock return and volume volatility. Time

trend variable, $Time$, accounts for possible time trends in $ARVOL$ and $ATVOL$. $Size$ is a natural logarithm of the market value of equity measured at the end of each quarter-year; $NumEst$ is the number of analysts issuing forecasts during each firm-quarter-year observation. The reporting lag, $RepLag$, is calculated as a difference between the earnings announcement date as reported by Compustat and the end date of the respective impairment quarter. Lev is leverage computed as a ratio of total liabilities to total assets, both of which are measured at the quarter end. $Loss$ is an indicator variable equal to 1 if a firm reports negative quarterly earnings per share, and zero otherwise. SUE is a mean standardized earnings surprise as reported quarterly by IBES database.

4.3 Factor Analysis

Since various triggering events are not independent and to increase the power of tests because of a small number of observations in certain triggering events categories, I combine the triggering event variables into factors using exploratory factor analysis (see Table 4.1). Initially, the number of components extracted is equal to the number of variables being analyzed, necessitating that a decision must be made on how many components are truly meaningful and should be retained for rotation and interpretation. I use a combination approach to determine the number of meaningful components to retain (Hatcher (1994)). In particular, besides the eigenvalue criterion, I consider results of the scree test, proportion of variance accounted for and interpretability criteria. Consequently, I retain the 3 factors described below. The scree test indicates that Factor 1 is positively associated with the following variables: poor past operational performance, the expectation of lower future performance and declined market capitalization. Factor 2 demonstrates the highest loadings on the economy- and industry-level triggering events. Finally, Factor 3 is positively associated with competition, major customer loss and introduction of new legislation or regulation affecting the firm. Together, the three factors explain up to 95% of the data variance.

After the varimax rotation, the rotated factor pattern demonstrates a so-called "simple structure" through the following characteristics: (a) Most of the variables have relatively high factor loadings on only one component and near zero loadings on the other components, and (b) most components

Table 4.1: Exploratory Factor Analysis

Triggering event	Factor1	Factor2	Factor3
Business restructuring	-17	-15	1
Recognition after denial	-19	2	-8
Expectation of low performance	-36	11	14
Decline in market cap	-36	12	-13
Poor operational performance	-45	-8	16
Industry Factors	-9	48	11
Economic Factors	-9	41	-3
Other	3	11	-2
New legislation or regulation	-2	-3	40
Major customer loss	-2	-8	31
Competition	-1	5	26
Currency issues/exchange rates	4	11	16
Rising costs	-4	10	14
Asset sale/expectation of sale/closure	-9	5	8
Restatement to previous impairment	1	-3	-1
Eigenvalue	3.40	1.56	1.03

This table presents factor loadings based on the exploratory factor analysis. All loadings are multiplied by 100.

have relatively high factor loadings for some variables, and near-zero loadings for the remaining variables. As for the interpretability criteria, variables that load on each given factor share the same conceptual meaning. Factor 1 is associated with the firm-level operational performance, with declining market capitalization being a reflection of the poor performance. Factor 2 is strongly influenced by the economy- and industry-level circumstances, both of which are external factors affecting a firm. Finally, Factor 3 is associated with firm-level events like major customer loss, increased competition[1] or regulatory developments directly affecting a firm. I conclude that even though I retain three factors, they generally fall into two main categories: firm-specific and economy-/industry-specific factors.

4.4 Predicting Goodwill Impairments

Survival analysis is often used when researchers work with longitudinal data that contain information about the occurrence of events. One of the main tools of survival analysis is proportional hazard model, where event hazard (which sometimes can be interpreted as an instantaneous probability) is a product of a baseline hazard function and an exponentiated linear function of fixed covariates. The classical assumption of the proportional hazard model is that covariates do not change over time and that there is at most one event for each subject. Previous research (for example, see Hayn and Hughes (2006)) uses a Cox hazard model to identify determinants of the goodwill impairment with an underlying assumption that no firm experiences more than one goodwill impairment. However, post-142 evidence suggests that this assumption might no longer be reasonable: as demonstrated by the hand-collected sample (Table 4.2), the majority of the firms experience more than one goodwill impairment between 2003-2013.

In this paper I extend the standard assumptions of a proportional hazard model to estimate a firm's probability of recording a goodwill impairment, conditional on the time elapsed since the firm's previous goodwill write-down and triggering events that were disclosed by a firm at the time

[1]In this setting I interpret competition as a firm-specific triggering event rather than an industry-specific one. For more on the premise of this interpretation see Bushman et al. (2016).

Table 4.2: Distribution of Firms by Number of Goodwill Impairments, 2003-2013.

Number of Impairments	Number of Firms
1	103
2	67
3	26
4	15
5	7
6	3
7	3
9	1
10	2

of the last goodwill write-down. The proportionality assumption in the Cox hazard model means that the effect of each covariate is the same at all points of time. In the case of time-varying covariates like firm size, leverage, etc. this assumption is violated because time-dependent covariates change at different rates for different companies. Hence the ratio of firm's hazards do not remain constant and model parameters have to be estimated using the partial likelihood method.

Recognition of multiple impairments by the same firm introduces possible dependence structure between subsequent impairments. Failure to take dependence into account may lead to standard error estimates that are biased downward and test statistics that are biased upward. To correct for dependence among multiple impairments recorded by the same firm I employ a robust variance estimator (modified sandwich estimator). This method was developed for Cox regression by Wei et al. (1989) and does not require any assumptions about the nature or structure of the dependence. For a detailed description see Therneau and Grambsch (2000).

I use the following hazard model for individual triggering events:

$$\begin{aligned}\log h_i(t) = \alpha_i(t) &+ \sum_{k=1}^{13} \beta_k TrigEvent_{ki} \\ &+ \beta_{14} Size_i(t) + \beta_{15} Leverage_i(t) + \beta_{16} DebtCov_i(t) \\ &+ \beta_{17} Tenure_i(t) + \beta_{18} Bonus_i(t) + \beta_{19} MngmtChange_i(t) \\ &+ \beta_{20} ImpPrevQ_i(t) + \beta_{21} GDPChUS(t) \\ &+ \beta_{22} GDPChEU(t) + \beta_{23} Will5000Ch(t) + \beta_{24} VIXCh(t)\end{aligned} \tag{4.6}$$

and triggering events factors:

$$\begin{aligned}\log h_i(t) = \alpha_i(t) &+ \beta_1 Factor1_i + \beta_2 Factor2_i + \beta_3 Factor3_i \\ &+ \beta_4 Size_i(t) + \beta_5 Leverage_i(t) + \beta_6 DebtCov_i(t) \\ &+ \beta_7 Tenure_i(t) + \beta_8 Bonus_i(t) + \beta_9 MngmtChange_i(t) \\ &+ \beta_{10} ImpPrevQ_i(t) + \beta_{11} GDPChUS(t) \\ &+ \beta_{12} GDPChEU(t) + \beta_{13} Will5000Ch(t) + \beta_{14} VIXCh(t).\end{aligned} \tag{4.7}$$

In specifications (4.6) and (4.7) the function $h_i(t)$ defines a hazard of subsequent impairment for company i, t is time since previous impairment, $\alpha_i(t)$ is a baseline hazard, which captures each firm's intrinsic temporal goodwill impairment pattern. This formulation also includes a covariate function, which captures the influence of other variables (such as triggering events, size, leverage, etc.) on the hazard of multiple write-downs. Triggering events in equation (4.6) are defined in Table 1.1. Control variables are defined in Table 3.1.

CHAPTER 5
RESULTS

5.1 Descriptive Statistics

Descriptive statistics for data used in this study are presented in Tables 1-8. Table 1.1 provides a list of and disclosure examples and counts for all triggering events hand-collected from EDGAR's annual/quarterly reports. I identify 16 distinct triggering event categories. Industry-specific factors, as well as poor past operational performance and expectation of lower future performance represent the most frequently disclosed impairment indicators with 114, 126 and 144 observations, respectively. The $Not\ disclosed$ category represents 36 reports that did not provide any information related to the goodwill impairment decision. Additionally, this table provides examples of disclosure related to observations classified as $Compustat\ error$ and $Recognition\ after\ denial$ to provide readers with a better understanding of the sample classification process.

Table 4.2 shows that the number of firms with multiple goodwill impairments (124) exceeds that of firms with just one goodwill write-down (103). Additionally, Table 5.1 classifies multiple goodwill impairment observations into two categories: $First\ impairment$, representing the first impairment recorded by a firm since the beginning of the sample; and $Subsequent\ impairment$, representing all subsequent goodwill write-downs that followed after the $First\ impairment$ recognition.

Table 5.1 presents goodwill impairment frequency counts by the calendar year and quarter. Consistent with the practice of conducting SFAS 142-related testing at the end of a calendar year, the majority of goodwill impairment recognitions occur during the fourth quarter of each year. The number of impairments is notably higher during years 2008-2009. This result is similar for a general

Table 5.1: Distribution of Goodwill Impairments by Year/Quarter and Impairment Sequence Number.

Year	Quarter	All Impairments	First Impairments	Subsequent Impairments
2003	2	10	10	0
	3	9	8	1
	4	11	8	3
2004	1	2	2	0
	2	2	2	0
	3	8	6	2
	4	6	4	2
2005	1	4	3	1
	2	5	4	1
	3	4	2	2
	4	15	12	3
2006	1	5	4	1
	2	4	2	2
	3	2	2	0
	4	9	4	5
2007	1	4	4	0
	2	3	2	1
	3	5	3	2
	4	24	16	8
2008	1	13	7	6
	2	21	12	9
	3	17	3	14
	4	63	31	32
2009	1	23	13	10
	2	20	9	11
	3	11	2	9
	4	21	6	15
2010	1	5	2	3
	2	12	3	9
	3	6	0	6
	4	16	6	10
2011	1	8	4	4
	2	5	2	3
	3	4	0	4
	4	22	7	15
2012	1	6	0	6
	2	13	5	8
	3	12	3	9
	4	15	3	12
2013	1	4	1	3
	2	11	2	9
	3	12	4	8

population of goodwill impairments available in Compustat, reflecting the influence of the global financial crisis.

Descriptive statistics for goodwill impairing, positive goodwill and zero goodwill samples are reported in Tables 3.3 and 3.4. As expected, all three samples are close in terms of mean and median firm size. Goodwill-impairing firms carry a slightly larger goodwill balance than do positive goodwill firms. On average, firms across all samples are followed by 9 analysts and have a reporting lag of 32 to 36 days. Zero goodwill firms have almost twice as much leverage as do goodwill-impairing and positive goodwill firms. Mean reported loss (negative earnings per share) magnitudes are almost identical for goodwill-impairing and zero goodwill firms (23 and 26 cents per share, respectively). In contrast, positive goodwill firms without goodwill write-downs report an average loss of 8 cents per share.

5.2 The Information Content of Goodwill Impairment Disclosures

Figure 5.1 presents a plot of daily abnormal return volatility (abnormal trading volume) for three sample categories - goodwill impairing, positive goodwill and zero goodwill firms – in event time surrounding goodwill announcements. In particular, following (Landsman et al., 2012), I calculate daily $ARVOL$ ($ATVOL$) and regress it on event day fixed effects. The figure plots the coefficient estimates from this regression, which represent the conditional mean $ARVOL$ ($ATVOL$) on each day. Consistent with previous research findings ((Beaver, 1968), (Landsman and Maydew, 2002)) I document an increase in daily $ARVOL$ ($ATVOL$) in the days surrounding the news announcement date. Figure 5.1 demonstrates that firms with positive goodwill balances, both goodwill-impairing and non-impairing, experience a higher market reaction to earnings announcement news than do firms with zero goodwill balances [1] that represent a benchmark for earnings announcement reactions with no goodwill implications. This result suggests non-impairment by positive goodwill firms is informative as reflected by the $ARVOL$ and $ATVOL$ measures. For example, if the market expects

[1] As reported in Figure 5.2, the opposite was true before the introduction of SFAS 142.

Figure 5.1: Market reaction to earnings announcements by goodwill-impairing, positive goodwill and zero goodwill firms in 2003-2013, i.e. after SFAS 142 introduction. Left panel presents results for abnormal trading volume, right panel - for abnormal return volatility.

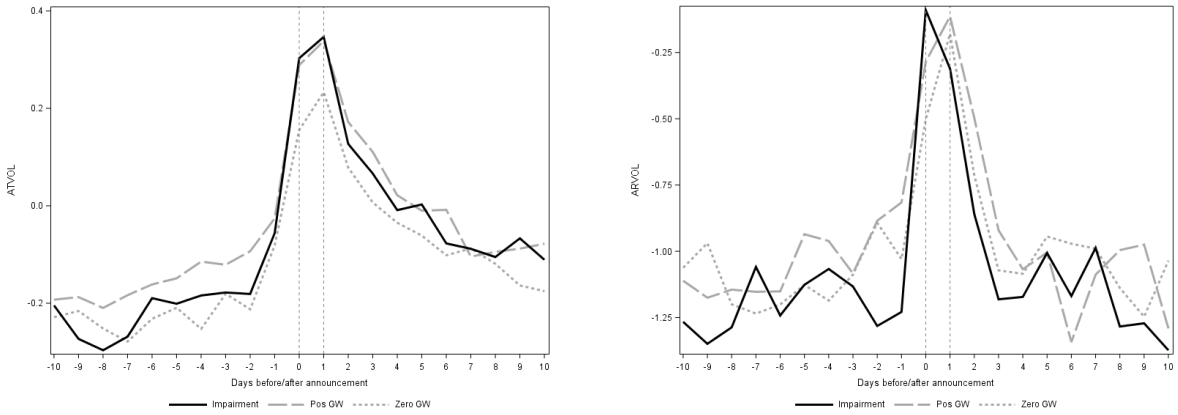
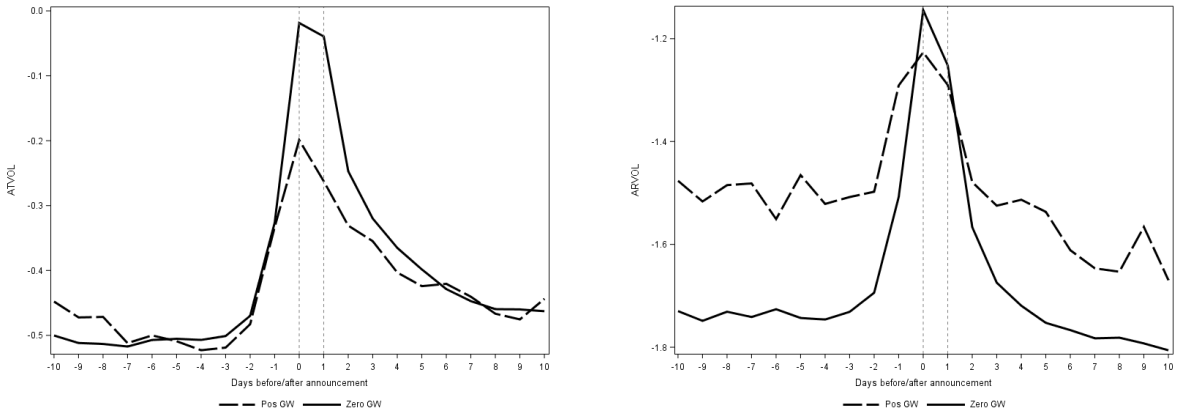


Figure 5.2: Market reaction to earnings announcements by positive goodwill and zero goodwill firms in 1991-2001, i.e. before SFAS 142 introduction. Left panel presents results for abnormal trading volume, right panel - for abnormal return volatility.



a goodwill impairment but a firm does not record it, the market prior expectations' adjustments manifest themselves through abnormal return volatility and/or abnormal trading volume.

As for goodwill-impairing firms, the magnitude of the $ARVOL$ and $ATVOL$ increases exceed the respective changes in both measures for the similar industry- and size-matched control firms that do not impair goodwill during the same quarter. The increased information content of goodwill-impairing firms' disclosures is evident in both figures.

I repeat the same analysis based on subsamples representing firms with particular triggering events disclosed in financial statements at the time of goodwill impairment news release. For parsimony, I report 3 representative figures for the following categories of triggering events - competition, declined market capitalization and economic factors (see Figure 5.3). When competition is disclosed as a triggering event for a goodwill impairment, it induces a significant spike in both abnormal return volatility and abnormal trading volume measures, consistent with a revision of expectations by both the overall market and individual investors. Disclosure of a decline in market capitalization as a reason for the goodwill impairment, on the other hand, does not seem to be associated with the significant market reaction. This is consistent with this information being already priced by the market since the decline in stock market price is easily observable before the impairment announcement. Finally, economic factors seem to be reflected by abnormal return volatility, but not abnormal trading. These initial observations lend support to hypothesis 1 in that they demonstrate a differential market reaction to goodwill announcement news depending on the particular triggering event disclosed by a firm.

Table 5.2 presents results of paired t-tests assessing whether changes in mean abnormal return volatility ($ARVOL$) and abnormal trading volume ($ATVOL$) of goodwill-impairing firms relative to those of positive-goodwill and zero-goodwill matched firms are statistically significant. For parsimony, triggering events with insignificant results for both information content measures were dropped from the table.

On the day of a goodwill impairment announcement, almost every triggering event results in a positive and statistically significant change in $ARVOL$ if compared to changes in abnormal return volatility of zero-goodwill firms. $Major\ customer\ loss$ and $Rising\ costs$ are the only exceptions demonstrating a statistically significant positive difference on the next day (day 1) after the goodwill impairment announcement (day 0). As for changes in abnormal trading volume $ATVOL$, significant and positive reaction is present during both day 0 and day 1 for most of the triggering event categories. These results suggest that disclosure of information surrounding a firm's decision to impair goodwill delivers (or leads to the production of) new information.

Next, I compare differences in disclosure's information content between goodwill-impairing firms and non-impairing positive-goodwill firms since these two company categories closely resemble each other based on industry and size. On day 0, $Industry-specific\ factors$, increased $Competition$, poor operational past and future performance and $Business\ restructuring$ result in positive and statistically significant changes in $ARVOL$, indicating changes in expectations of the market as a whole. As already mentioned above, the market reaction to $Major\ customer\ loss$ and $Rising\ costs$, while initially insignificant, becomes significantly positive on day 1. The $ATVOL$ measure reveals significantly positive coefficients on $Asset\ sale/expectation\ of\ sale$ and $Strategic\ change$, suggesting that these triggering events are associated with revisions of idiosyncratic expectations. Positive coefficients on these impairment indicators reveal an increase in the information content of the disclosure. Consistent with Figure 5.3 analyzed above, $Decline\ in\ market\ capitalization$ does not generate a significant market response. Firms that announce goodwill impairment but provide no further details ($Not\ disclosed$) experience significantly positive change in abnormal return volatility on day 0. However, this result reverses on day 1 with $ARVOL$ becoming significantly negative.

Taken together, these results strongly support Hypothesis 1. The market reaction to goodwill impairments depends on the nature of the underlying event that resulted in impairment recognition. Positive coefficients for triggering events indicate an increase in information content of goodwill impairment-related disclosure under the SFAS-142 regime. Additionally, this evidence provides a possible explanation to previous research findings that documented non-existent or weak market reaction to goodwill write-downs. First, an insignificant market reaction to some triggering events might obscure the significance of other impairment indicators if an average effect is measured across all impairment observations during a particular period of time. Second, use of two- or three-day moving averages during the market reaction measurement period might also result in insignificant findings as demonstrated above by the $Not\ disclosed$ category of events.

Table 5.3 reports the results from estimating equations (4) and (5) for goodwill-impairing firms and the matching samples of control firms. Exploratory factor analysis in Section 4.3 aggregated

triggering event variables into 3 factors. Factors 1 and 3 are positively correlated with firm-level disclosures, while Factor 2 is strongly influenced by the economy- and industry-related disclosure. Table 5.3 reveals that Factor 3 is significantly positive on day 0, while Factor 1 becomes positive and significant on day 1. Factor 2, which is positively correlated with economic- and industry-level factors, is insignificant during both days. This result strongly supports Hypothesis 1a. Positive and significant coefficients on firm-level disclosure factors indicate increased information content of firm-specific disclosures relative to the economy- and industry-level ones. Results for the $ATVOL$ measure imply the same inferences, lending support to Hypothesis 1b. Factor 3 is the only factor in this specification with statistically significant positive coefficient. Taken together, the evidence from factor-specific tests suggests that firm-level triggering event disclosure is associated with an increase in the information content of goodwill impairment announcements as measured by abnormal return volatility and abnormal trading volume.

5.3 Market Microstructure Effects of Goodwill Impairment Disclosure

To test my hypotheses related to market asymmetry, I first compare bid-ask spread and liquidity behavior around goodwill impairment announcement dates for goodwill-impairing, positive goodwill and zero goodwill firms. Results are depicted in Figure 5.5. I do not find significant evidence of changes in bid-ask spreads during the extended time before the disclosure, rejecting hypotheses 2 and 3. This result is consistent with the idea that trading before the disclosure date is not based on the private information about an impairment leaked to the market before the earnings announcement. However, consistent with the theoretical predictions of (Kim and Verrecchia, 1994), I find that bid-ask spreads increase at the time of joint goodwill impairment/earnings announcements and return to previous levels several days after impairment disclosure.[2] Differences in bid-ask spread

[2]Some triggering events ($Expectation\ of\ lower\ future\ performance$, $New\ legislation/regulation$ and others related to firm-specific disclosures) demonstrate increases in bid-ask spreads in days leading up to the announcement. For example, $Rising\ costs$ (see Figure 5.6c) shows initial increase in bid-ask spreads between the days -2 and -1. This is consistent with (Kim and Verrecchia, 1994)'s prediction that the market maker raises bid-ask spreads to price-protect against the pre-disclosure information asymmetry after observing an order flow from traders.

increases are significant across all three groups of firms. Among the triggering event subgroups (see Figure 5.6), firms that disclose impairment indicators such as $Major\ Customer\ Loss$, $Rising\ Costs$ and $Strategic\ Change$ experience the largest increase in bid-ask spreads. Impairment recognition without further disclosure ($Not\ Disclosed$) also results in a significant bid-ask spread increase (see Table 5.4).

Overall, the evidence suggests that goodwill impairment disclosure does not reduce information asymmetry, but rather temporarily increases it around announcement dates. This finding strongly supports Hypothesis 4 and is consistent with (Kim and Verrecchia, 1994)'s idea that certain disclosures provide information that allows sophisticated traders to make judgments about a firm's performance that are superior to the judgments of other traders. In particular, the disclosure of firm-specific private information or the decision not to disclose any details about an impairment seem to constitute the main incentives for expert traders to acquire/produce new private information about a goodwill-impairing firm.

As for liquidity, different triggering events are associated with different changes in liquidity around goodwill impairment announcements. Disclosure of $Major\ Customer\ Loss$, $Rising\ Costs$ and $Competition$ is related to a post-announcement decrease in liquidity. Firms that choose not to disclose details about their goodwill impairment decision experience decrease in liquidity as well. Disclosure of economy- and industry-related triggering events have no effect on liquidity levels. Combined with evidence on changes in bid-ask spreads, presented results strongly support Hypothesis 5, suggesting that firm-specific goodwill impairment disclosure is associated with post-announcement information asymmetry changes, while disclosure related to information that might be publicly available elsewhere is not.

5.4 Tests of the Predictive Power of Goodwill Impairment Disclosure

Table 5.5 presents results of the proportional hazard model estimation to assess whether goodwill impairment-related disclosures at time t have significant effects on a probability of goodwill impairment happening in subsequent periods t+n.

Hazard ratios can be interpreted almost exactly like odds ratios in logistic regression (Allison (2010)). For indicator variables with values of 1 and 0, as is the case with triggering events in this study, the hazard ratio is interpreted as a ratio of the estimated hazard for those with a value of 1 to the estimated hazard for those with a value of 0 (controlling for the other covariates). For example, the estimated hazard ratio for Factor 3, which is highly positively correlated with firm-level disclosures, is 12.42. This means that the hazard of a subsequent goodwill impairment recognition for firms that disclosed triggering events correlated with Factor 3 is 12.42 times higher than for firms that did not make such disclosure. Factor's 3 significantly positive coefficient also indicates a shorter time to next impairment for firms disclosing firm-specific reasons for goodwill impairment decisions. Factors 1 and 2 have insignificant coefficients indicating that disclosures related to firm-level operational performance and economy- and industry-related triggering events do not have significant effects on subsequent goodwill impairment recognition.

As for the control variables, they generally follow previous research findings. The presence of a $Bonus$ in CEO's compensation reduces the probability of subsequent goodwill write-down and extends the time to next impairment, as does the presence of a debt covenant. $CEO\ tenure$, however, demonstrates a result that goes against previous findings. In particular, both the hazard ratio and significantly positive coefficient for this variable indicate that the longer the CEO's tenure, the higher the probability of a subsequent goodwill impairment. Note, however, that the setting of this hazard model analyzes a sequence of multiple impairments by each firm unlike previous models that treat each impairment as a single separate event. Keeping this in mind, it seems reasonable to expect eventual goodwill impairment recognition even if managers apply discretion in terms of write-down timing. Managers can exercise discretion and choose to delay impairment recognition, but they cannot avoid it completely when clear economic impairment indicators are eventually present. Additionally, longer CEO tenure indicates more managerial experience, including experience with asset impairment recognition decisions. This explanation is supported by findings of (Li et al., 2011) that document more frequent goodwill impairments of smaller magnitudes during the post-SFAS 142 period.

Table 5.2: Differences in Abnormal Return Volatility ($ARVOL$) and Abnormal Trading Volume ($ATVOL$) Changes in Response to Goodwill Impairment/Earnings Announcements, by Triggering Event

	Day 0 (ARVOL)		Day 1 (ARVOL)		Day 0 (ATVOL)		Day 1 (ATVOL)	
Triggering Event	GWImpair - ZeroGW	GWImpair - PositiveGW	GWImp - ZeroGW	GWImp - PositiveGW	GWImp - ZeroGW	GWImp - PositiveGW	GWImp - ZeroGW	GWImp - PositiveGW
Economic Factors	0.398**	0.18	0.032	-0.033	0.142***	0.009	0.096*	-0.009
	(2.40)	(1.094)	(0.182)	(-0.191)	(2.7)	(0.184)	(1.872)	(-0.193)
Industry Factors	0.441***	0.233	-0.043	-0.108	0.167***	0.034	0.149***	0.044
	(2.656)	(1.354)	(-0.231)	(-0.575)	(3.527)	(0.753)	(3.089)	(1.01)
Decline in market cap	0.283	0.066	0.096	0.030	0.051	-0.082	0.051	-0.054
	(1.397)	(0.326)	(0.503)	(0.156)	(0.68)	(-1.094)	(0.673)	(-0.736)
Poor oper perform	0.515***	0.298*	-0.046	-0.112	0.108*	-0.026	0.078	-0.027
	(3.203)	(1.862)	(-0.293)	(-0.69)	(1.715)	(-0.418)	(1.285)	(-0.465)
Expectation of low perf	0.443***	0.226	0.12	0.055	0.137**	0.004	0.109*	0.004
	(2.658)	(1.361)	(0.769)	(0.343)	(2.367)	(0.073)	(1.873)	(0.07)
Competition	0.986***	0.768***	-0.289	-0.355	0.243**	0.11	0.121	0.016
	(4.078)	(3.186)	(-0.782)	(-0.955)	(2.196)	(1.005)	(1.302)	(0.178)
Major customer loss	0.268	0.050	0.656***	0.591***	0.021	-0.112	0.152*	0.046
	(0.836)	(0.158)	(3.146)	(2.793)	(0.193)	(-1.054)	(1.581)	(0.5)
Asset sale/expectation	0.472**	0.255	-0.087	-0.153	0.164**	0.031	0.352***	0.247***
	(2.347)	(1.271)	(-0.415)	(-0.716)	(2.004)	(0.386)	(4.856)	(3.546)
Business restructuring	1.131***	0.913***	0.113	0.047	0.163	0.03	-0.026	-0.131
	(3.801)	(3.075)	(0.311)	(0.129)	(0.802)	(0.149)	(-0.192)	(-0.976)
Rising costs	0.211	-0.007	0.684***	0.619**	-0.136	-0.269*	0.027	-0.078
	(0.710)	(-0.023)	(2.852)	(2.552)	(-0.839)	(-1.669)	(0.21)	(-0.617)
Strategic change	0.182	-0.035	0.183	0.118	0.174	0.041	0.369***	0.264***
	(0.396)	(-0.076)	(0.447)	(0.285)	(1.28)	(0.303)	(4.486)	(3.309)
Not disclosed	0.958***	0.74***	-0.884***	-0.949***	0.297***	0.164***	0.179	0.075
	(4.276)	(3.315)	(-2.616)	(-2.795)	(4.72)	(2.68)	(0.127)	(1.388)
Recognition after denial	0.034	-0.183	-0.161	-0.226	0.168	0.036	0.181**	0.076
	(0.094)	(-0.499)	(-0.411)	(-0.576)	(1.512)	(0.322)	(2.026)	(0.872)

This table presents the results of paired t-tests of significance of differences in abnormal return volatility ($ARVOL$) and abnormal trading volume ($ATVOL$) changes during days 0 and 1 of goodwill impairment/earnings announcement disclosures for goodwill-impairing firms relative to size- and industry-matched positive and zero goodwill firms. Triggering events are defined in Table 3.1 and described in more detail in Table 1.1 . $ARVOL$ and $ATVOL$ are as defined in Section 4.1. T-statistics in parentheses (*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$)

Table 5.3: The Information Content of Firm-Specific vs. Economy- and Indistry-Specific Impairment Disclosures, by Disclosure Factor

	Day 0 (ARVOL)		Day 1 (ARVOL)		Day 0 (ATVOL)		Day 1 (ATVOL)	
VARIABLES	Zero GW	Pos GW	Zero GW	Pos GW	Zero GW	Pos GW	Zero GW	Pos GW
Factor 1	0.124	-0.087	0.34*	0.228*	0.085*	0.009	0.12*	0.06*
	(0.64)	(-0.48)	(1.80)	(1.75)	(1.66)	(0.20)	(2.32)	(2.21)
Factor 2	0.348	0.211	0.164	0.07	0.061	0.01	0.076	0.036
	(1.57)	(1.01)	(0.77)	(0.31)	(1.05)	(0.19)	(1.29)	(0.70)
Factor 3	0.67*	0.661**	-0.16	-0.187	0.02	0.01	0.033	0.012
	(1.80)	(1.89)	(-0.45)	(-0.50)	(0.21)	(0.11)	(0.33)	(0.14)
Size	0.077**	0.059*	-0.065*	-0.053	0.045***	0.05***	0.034***	0.037***
	(1.93)	(1.80)	(-1.70)	(-1.51)	(4.28)	(6.03)	(3.20)	(4.58)
Leverage	0.006	-0.012	0.027	0.006	0.007	-0.232***	0.013**	-0.001
	(0.26)	(-0.44)	(1.17)	(0.24)	(1.07)	(-3.70)	(2.11)	(-0.15)
RepLag	-0.017***	-0.011***	-0.004	0.001	-0.003***	-0.004	-0.001	-0.002**
	(-3.70)	(-2.73)	(-0.80)	(0.15)	(-2.74)	(-0.39)	(-0.66)	(-2.01)
SUE	-0.025	-0.009	-0.035	-0.076	-0.006	0.003	-0.005	-0.007
	(-0.48)	(-0.19)	(-0.69)	(-1.49)	(0.671)	(0.22)	(-0.40)	(-0.58)
NumEst	-0.03**	-0.016	0.025	0.02	0.003	0.002	0.004	-0.001
	(-1.96)	(-1.13)	(1.67)	(1.33)	(0.86)	(0.48)	(0.96)	(-0.07)
RepLoss	-0.133	0.226	0.134	0.15	-0.134***	-0.006	-0.034	0.017
	(-0.68)	(0.99)	(0.71)	(0.61)	(-2.62)	(-0.10)	(-0.66)	(0.31)
Recognition after denial	-1.232**	-1.346***	-0.982*	-1.024*	-0.004	-0.05	-0.033	-0.067
	(-2.11)	(-2.46)	(-1.75)	(-1.74)	(-0.02)	(-0.36)	(-0.21)	(-0.50)
Not disclosed	1.105***	0.724**	-1.37***	-1.557***	0.145	-0.008	0.12	0.011
	(2.72)	(1.88)	(-3.50)	(-3.78)	(1.37)	(-0.08)	(1.12)	(0.12)
Observations	866	730	866	730	866	730	866	730
Adjusted R^2	0.05	0.05	0.05	0.05	0.10	0.08	0.05	0.05

This table presents the results of estimating equations (4.4) and (4.5) for goodwill-impairing firms and size- and industry-matched samples of positive goodwill and zero goodwill firms. Triggering events are grouped into 3 factors through exploratory factor analysis (see Section 4.3). $ARVOL$ and $ATVOL$ are as defined in Section 4.1. T-statistics in parentheses (*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$)

Table 5.4: Market Microstructure Effects of Goodwill Impairment Disclosures

Panel A. Bid/Ask spread: GWImpair - ZeroGW

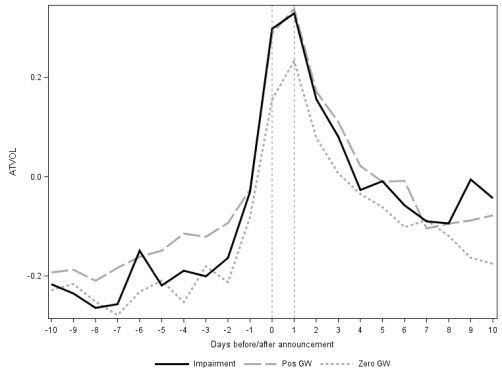
	Days before/after announcement								
Triggering Event	-4	-3	-2	-1	0	1	2	3	4
Major cust loss	-0.009	-0.011	-0.011	-0.014	-0.009	0.000	-0.015	-0.014	-0.012
	(-2.26)**	(-3.28)***	(-3.50)***	(-2.81)***	(-1.44)	(-0.05)	(-3.53)***	(-3.54)***	(-1.89)*
Rising costs	0.000	0.001	0.004	0.017	0.001	0.022	0.010	-0.002	0.012
	(0.041)	(0.097)	(0.544)	(1.335)	(0.070)	(2.022)**	(1.475)	(-0.36)	(1.248)
Strategic change	0.015	0.016	0.034	0.015	0.035	0.048	0.036	0.022	0.023
	(1.396)	(2.039)**	(2.006)**	(1.537)	(2.456)**	(3.246)***	(2.051)**	(2.230)**	(2.502)***
Not disclosed	0.007	0.000	0.005	0.004	0.046	0.000	0.006	0.005	0.005
	(0.825)	(-0.08)	(0.840)	(0.661)	(2.054)**	(-0.00)	(0.953)	(0.850)	(0.998)
Panel B. Bid/Ask spread: GWImpair - PositiveGW									
Major cust loss	-0.00	-0.01	-0.00	-0.00	-0.01	-0.00	-0.01	-0.01	-0.00
	(-1.71)**	(-2.89)***	(-3.06)***	(-2.02)**	(-1.92)*	(-0.09)	(-3.17)***	(-3.30)***	(-1.09)
Rising costs	0.002	0.001	0.005	0.021	-0.00	0.021	0.011	-0.00	0.016
	(0.349)	(0.262)	(0.781)	(1.665)*	(-0.26)	(1.969)**	(1.646)*	(-0.24)	(1.761)*
Strategic change	0.017	0.016	0.035	0.019	0.032	0.047	0.037	0.022	0.027
	(1.600)	(2.183)**	(2.098)**	(1.958)*	(2.239)**	(3.205)***	(2.122)**	(2.288)**	(3.033)***
Not disclosed	0.009	0.000	0.006	0.008	0.042	-0.00	0.007	0.005	0.010
	(1.071)	(0.172)	(1.121)	(1.372)	(1.914)*	(-0.04)	(1.144)	(0.949)	(1.891)*
Panel C. Amihud measure: GWImpair - ZeroGW									
Competition	-7.18	-6.54	-10.1	-9.23	-5.55	-7.83	-1.35	-9.12	-6.42
	(-4.81)***	(-2.71)***	(-3.68)***	(-4.42)***	(-3.62)***	(-4.30)***	(-0.50)	(-5.53)***	(-3.43)***
Major cust loss	5.614	-2.95	-6.78	-5.47	10.49	26.20	-0.53	1.523	-3.26
	(0.654)	(-0.56)	(-1.49)	(-1.49)	(1.198)	(1.447)	(-0.16)	(0.272)	(-1.11)
Rising costs	-5.61	-7.43	-9.48	-10.1	-5.79	-5.45	-3.98	-8.96	-7.84
	(-2.63)***	(-3.17)***	(-3.07)***	(-5.57)***	(-3.37)***	(-2.21)**	(-1.73)*	(-5.38)***	(-5.72)***
Panel D. Amihud measure: GWImpair - PositiveGW									
Competition	-4.31	-5.62	-3.56	-4.94	-4.33	-3.35	-4.16	-4.06	-4.12
	(-6.66)***	(-6.03)***	(-3.30)***	(-7.30)***	(-6.10)***	(-6.90)***	(-6.89)***	(-6.94)***	(-6.98)***
Major cust loss	-0.98	-0.64	-0.72	0.334	-1.03	-0.14	1.323	-2.31	1.056
	(-0.76)	(-0.25)	(-0.35)	(0.129)	(-0.67)	(-0.11)	(0.437)	(-2.67)***	(0.368)
Rising costs	-0.66	-1.31	-0.86	-1.91	-0.72	-0.96	-0.76	-0.95	0.197
	(-0.55)	(-0.75)	(-0.74)	(-1.87)*	(-0.56)	(-1.09)	(-0.65)	(-0.89)	(0.134)

Table 5.5: Hazard Model Estimates of the Predictive Power of Individual Triggering Event Disclosures and Factor groupings.

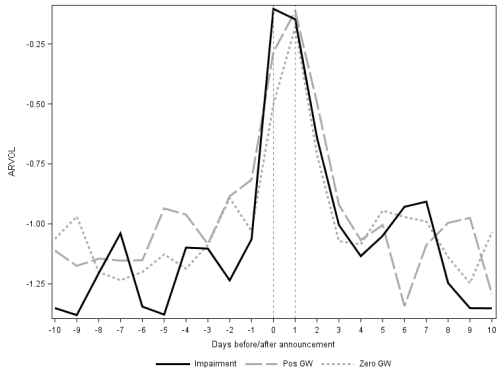
Specification	Covariates	Parameter Estimate	P-value	Hazard Ratio
Individual Triggering Events	*Economic Factors*	-0.09	0.87	0.91
	Industry Factors	-0.52	0.1	0.59
	Decline in market cap	-1.72	0.01	0.18
	Poor operational performance	0.37	0.18	1.46
	Expectation of low performance	0.58	0.19	1.78
	Competition	-0.39	0.16	0.67
	Major customer loss	1.62	0.05	5.05
	Asset sale/expectation of sale	-0.53	0.25	0.58
	Business restructuring	-0.53	0.3	0.58
	Rising costs	-0.43	0.49	0.64
	Strategic change	-0.53	0.31	0.59
	Not disclosed	-0.35	0.65	0.7
	Recognition after denial	1.59	0.01	4.92
	Size	0.11	0.54	1.11
	Leverage	-0.19	0.37	0.82
	Debt covenant	-0.36	0.41	0.56
	Tenure	-0.01	0.84	0.99
	Bonus	-0.001	0.26	1
	MngmtChange	0.45	0.25	1.58
	Imp_Prev_Q	19.22	0.0001	2.229
	GDPChange_US	-64.42	0.0001	0
	GDPChange_EU	-53.47	0.0001	1.668
	Will5000	-4.85	0.01	0.008
	VIX	1.67	0.0002	1.18
Factor Groupings	*Factor 1*	0.17	0.85	1.19
	Factor 2	1.41	0.24	4.12
	Factor 3	7.12	0.005	12.42
	Size	0.09	0.61	1.13
	Leverage	0.24	0.25	1.28
	Debt covenant	-0.13	0.09	0.80
	Tenure	0.12	0.08	1.13
	Bonus	-0.03	0.0003	0.97
	MngmtChange	2.57	0.12	13.08
	ImpPrevQ	20.33	0.0001	6.75
	GDPChUS	-0.05	0.87	0.95
	GDPChEU	-0.04	0.15	0.71
	Will5000Ch	-2.87	0.26	0.55
	VIXCh	0.01	0.5	1.01

This table presents the results of estimating equations (4.6) and (4.7) on a subsample of firms with multiple impairments. The dependent variable is a function $h_i(t)$ which defines a hazard of subsequent impairment for company i. Control variables are as defined in Table 3.1.

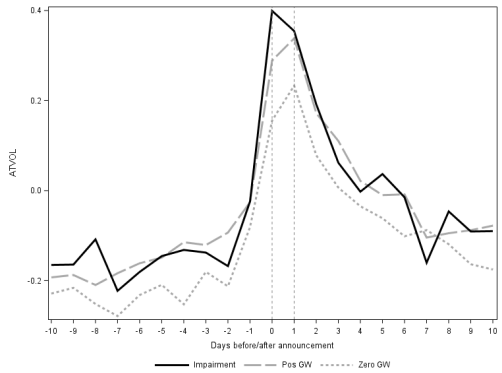
Figure 5.3: Market reaction to goodwill impairment disclosure that names economy-wide developments, competition or decline in market capitalization as a triggering event. Positive and zero goodwill firms represent companies matched to impairing firms by size and industry. Left panels present results for abnormal trading volume, right panels – for abnormal return volatility.



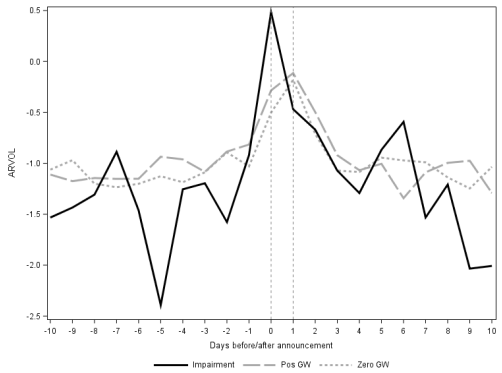
(a) ATVOL: economy-wide developments



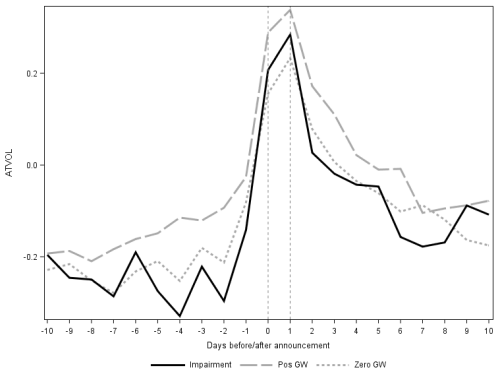
(b) ARVOL: economy-wide developments



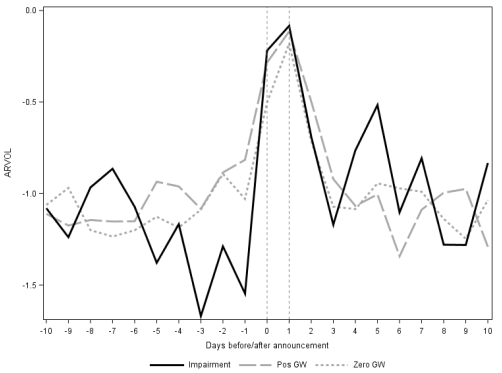
(c) ATVOL: competition



(d) ARVOL: competition



(e) ATVOL: decline in market cap



(f) ARVOL: decline in market cap

Figure 5.4: Bid-ask spreads and market liquidity around earnings announcement days of positive goodwill and zero goodwill firms in 1991-2001, i.e. before SFAS 142 introduction. Market liquidity is measured by the Amihud measure. Left panel demonstrates bid-ask spreads, right panel shows Amihud measure.

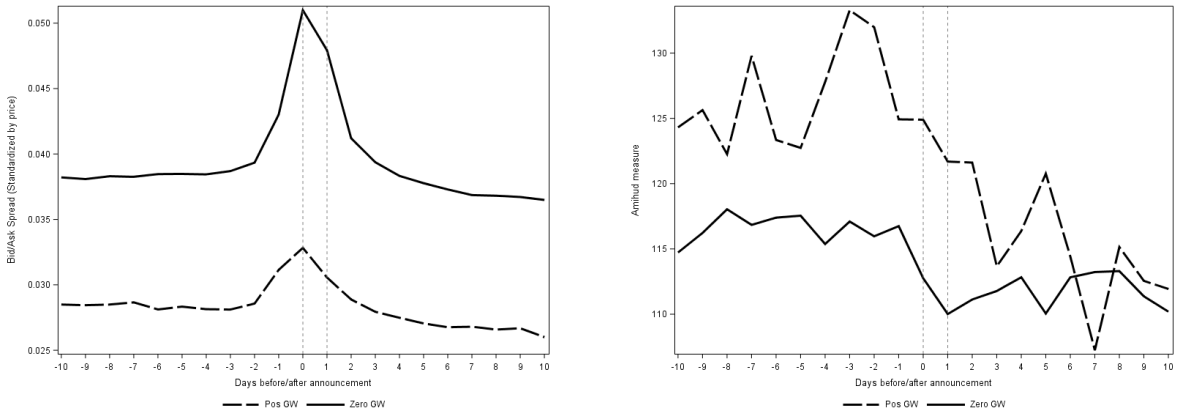


Figure 5.5: Bid-ask spreads and market liquidity around goodwill impairment/earnings announcement days of goodwill-impairing, positive goodwill and zero goodwill firms in 2003-2013, i.e. after SFAS 142 introduction. Market liquidity is measured by the Amihud measure. Left panel demonstrates bid-ask spreads, right panel shows Amihud measure.

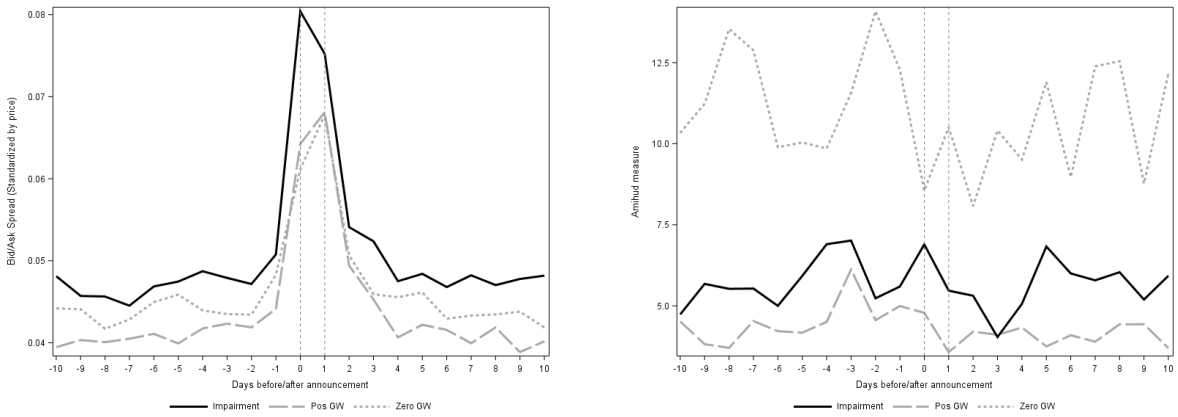
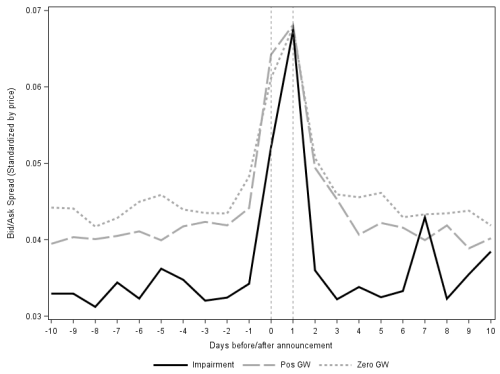
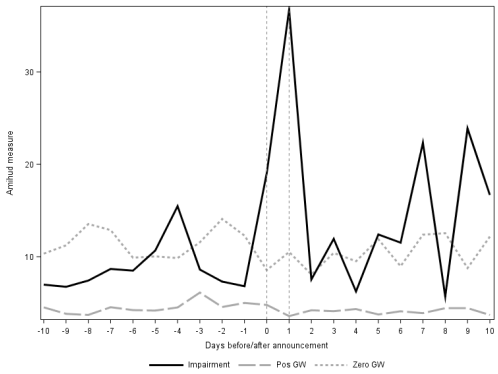


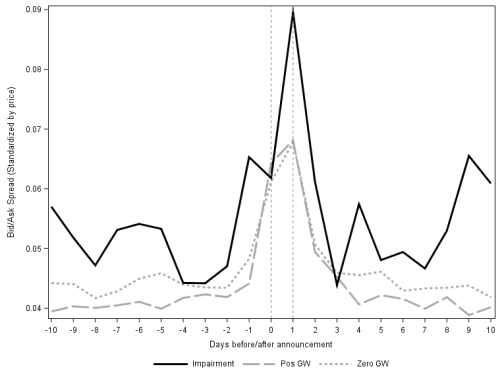
Figure 5.6: Bid-ask spreads and market liquidity around goodwill impairment/earnings announcement days of goodwill-impairing, positive goodwill and zero goodwill firms in 2003-2013. Goodwill-impairing group of firms consists only of those that disclosed major customer loss, rising costs as a triggering event or did not disclose any details about a goodwill write-down. Market liquidity is measured by the Amihud measure. Left panel demonstrates bid-ask spreads, right panel shows Amihud measure.



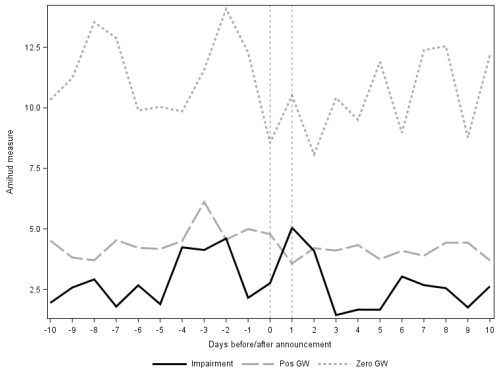
(a) BAS: major customer loss



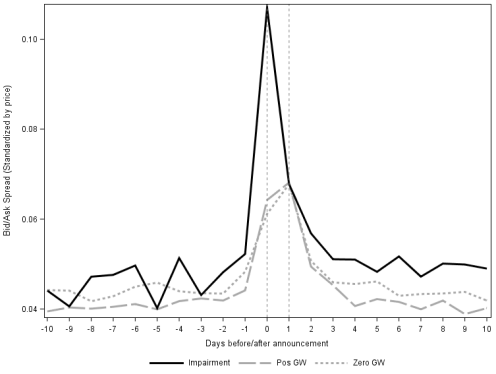
(b) Amihud: major customer loss



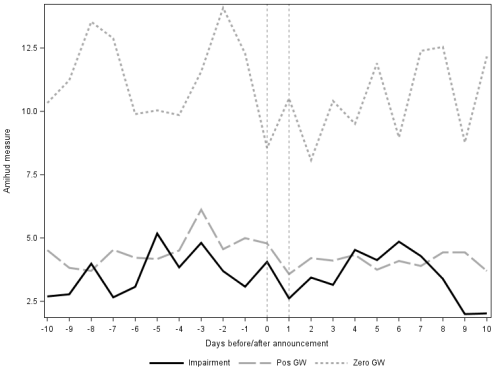
(c) BAS: rising costs



(d) Amihud: rising costs



(e) BAS: not disclosed



(f) Amihud: not disclosed

CHAPTER 6
CONCLUSIONS

This paper studies the information content of SFAS 142-mandated disclosures. In particular, the hand-collected sample contains information on triggering events that firms disclose at the time of a goodwill impairment announcement. Tests of the market reaction to such announcements reveal several findings. First, market reaction to a firm's decision to impair goodwill differs depending on the underlying triggering event cited by a firm. This finding may explain previous mixed evidence on market reactions to goodwill impairment recognition. While some triggering events are associated with significant market response, others demonstrate insignificant relation. Moreover, abnormal return volatility and abnormal trading volume indicate that different triggering events may influence each of these measures separately, suggesting that underlying impairment reasons have a differential impact on the average change in investors' beliefs and idiosyncratic reactions of individual investors. Thus, goodwill impairment market response test results may imply different inferences depending on the employed market reaction measures, sample timing and triggering events cited by firms at the time of goodwill impairment announcements. Second, initial evidence suggests that SFAS 142 altered market response to earnings announcements for firms with positive goodwill balances. During post-SFAS 142 period, positive goodwill firms experience stronger earnings announcement reactions compared to firms without goodwill. This result holds for both goodwill-impairing and non-impairing firms. Finally, I demonstrate that firm-level triggering events are significantly associated with future goodwill impairments when a company records multiple impairments. The presence of significant associations between current triggering events and the likelihood of subsequent goodwill write-downs indicate that financial statements provide

information that helps investors to gain a better understanding of a firm's subsequent performance, as intended by FASB at the time of SFAS 142 introduction.

BIBLIOGRAPHY

Allison, P. (2010). *Survival Analysis Using SAS: A Practical Guide*, volume 64. SAS Institute.

Atiase, R. K. and Bamber, L. S. (1994). Trading volume reactions to annual accounting earnings announcements. The incremental role of predisclosure information asymmetry. *Journal of Accounting and Economics*, 17(3):309–329.

Ball, R. and Brown, P. (1968). An Empirical Evaluation of Accounting Income Numbers. *Journal of Accounting Research*, 6(2):159–178.

Beatty, A. and Weber, J. (2006). Accounting discretion in fair value estimates: An examination of SFAS 142 goodwill impairments. *Journal of Accounting Research*, 44(2):257–288.

Beaver, W. H. (1968). The Information Content of Annual Earnings Announcements. *Journal of Accounting Research*, 6(1-2):67.

Bens, D. a., Heltzer, W., and Segal, B. (2011). The Information Content of Goodwill Impairments and SFAS 142. *Journal of Accounting, Auditing & Finance*, 26(3):527–555.

Blankespoor, E., Miller, B. P., and White, H. D. (2014). Initial evidence on the market impact of the xbrl mandate. *Review of Accounting Studies*, 19(4):1468–1503.

Bushman, R. M., Hendricks, B. E., and Williams, C. D. (2016). Bank competition: Measurement, decision-making, and risk-taking. *Journal of Accounting Research*, 54(3):777–826.

Chen, C., Kohlbeck, M., and Warfield, T. (2008). Timeliness of impairment recognition: Evidence from the initial adoption of SFAS 142. *Advances in Accounting*, 24(1):72–81.

DeFond, M., Hung, M., and Trezevant, R. (2007). Investor protection and the information content of annual earnings announcements: International evidence. *Journal of Accounting and Economics*, 43(1):37–67.

Demerjian, P. R. and Owens, E. L. (2016). Measuring the probability of financial covenant violation in private debt contracts. *Journal of Accounting and Economics*, 61(2-3):433–447.

EY (2016). Goodwill and Other Intangibles. Technical Report July, Ernst&Young LLP, New-York.

FASB (2001). Goodwill and Other Intangible Assets. Statement of Financial Accounting Standards 142. Norwalk(CT):FASB.

Francis, J., Hanna, J. D., and Vincent, L. (1996). Causes and Effects of Discretionary Asset Write-Offs. *Journal of Accounting Research*, 34(3):117–134.

Gu, F. and Lev, B. (2011). Overpriced shares, Ill-advised acquisitions, and goodwill impairment. *Accounting Review*, 86(6):1995–2022.

Hatcher, L. (1994). *A Step-by-Step Approach to Using the SAS System for Factor Analysis and Structural Equation Modeling*. SAS Publishing, 1st edition.

Hayn, C. and Hughes, P. J. (2006). Leading indicators of goodwill impairment. *Journal of Accounting, Auditing and Finance*, 21(3):223–265.

Hirschey, M. and Richardson, V. J. (2002). Information content of accounting goodwill numbers. *Journal of Accounting and Public Policy*, 21(3):173–191.

Hodder, L., Hopkins, P., and Schipper, K. (2013). Chapter 4: Verifiability of Fair Value Measurements: 4.1: Verifiability in the FASB's conceptual framework. *Foundations & Trends in Accounting*, 8(3/4):223–227.

Kim, O. and Verrecchia, R. E. (1991). Trading Volume and Price Reactions to Public Announcements University of Chicago Stable URL : http://www.jstor.org/stable/2491051 Trading Volume and Price Reactions to Public Announcements. *Journal of Accounting Research*, 29(2):302–321.

Kim, O. and Verrecchia, R. E. (1994). Market liquidity and volume around earnings announcements. *Journal of Accounting and Economics*, 17(1-2):41–67.

Knauer, T. and Wohrmann, A. (2016). Market reaction to goodwill impairments. *European Accounting Review*, 25(3):421–449.

Kothari, S. P. (2001). Capital Markets Research in Accounting. *Jounral of Accounting and Economics*, 31:105–231.

Landsman, W. R. and Maydew, E. L. (2002). Has the Information Content of Quarterly Earnings Announcements Declined in the Past Three Decades? *Journal of Accounting Research*, 40(3):797–808.

Landsman, W. R., Maydew, E. L., and Thornock, J. R. (2012). The information content of annual earnings announcements and mandatory adoption of IFRS. *Journal of Accounting and Economics*, 53(1-2):34–54.

Li, K. K. and Sloan, R. G. (2015). Has Goodwill Accounting Gone Bad? (Available on SSR). *CAAA Annual Conference 2011*, (December):1–52.

Li, Z., Shroff, P. K., Venkataraman, R., and Zhang, I. X. (2011). Causes and consequences of goodwill impairment losses. *Review of Accounting Studies*, 16(4):745–778.

Ramanna, K. and Watts, R. L. (2012). Evidence on the use of unverifiable estimates in required goodwill impairment. *Review of Accounting Studies*, 17(4):749–780.

Rees, L., Gill, S., and Gore, R. (1996). An Investigation of Asset Write-Downs and Concurrent Abnormal Accruals. *Journal of Accounting Research*, 34(3):157–169.

Riedl, E. J. (2004). An Examination of Long-Lived Asset Impairments. *The Accounting Review*, 79(3):823–852.

Strong, J. S. and Meyer, J. R. (1987). Asset Writedowns: Managerial Incentives and Security Returns. *Journal of Finance*, 42(3):643–661.

Therneau, T. M. and Grambsch, P. M. (2000). *Modeling survival data: extending the Cox model*. Springer Science & Business Media.

Wei, L. J., Lin, D. Y., and Weissfeld, L. (1989). Regression Analysis of Multivariate Incomplete Failure Time Data by Modeling Marginal Distributions.

Zucca, L. J. and Campbell, D. R. (1992). A Closer Look at Discretionary Writedowns of Impaired Assets. *Accounting Horizons*, 6(3):30–41.