THE EFFECTS OF GOODWILL IMPAIRMENTS ON STOCK PRICES

by

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A THESIS

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Stock price changes have a profound effect on the everyday lives of the general population. These fluctuations are heavily influenced by accounting practices because of their effects on earnings and company valuation. The behavior of stocks is complex and unpredictable, therefore it is important to study the individual factors that might influence them. One such factor is goodwill impairment, the stock market effects of which I examine in this thesis. Goodwill impairment results in the decrease of a company's book value and is generally regarded as an unfavorable adjustment to incur. Because of its effect on company value, my thesis examines whether or not goodwill impairment also affects company stock prices by examining impairments during the Great Recession of 2007. I hypothesize that the size of a goodwill impairment has a positive correlation with decreases in stock price, and that the later the goodwill impairment is incurred relative to the beginning of the Great Recession in September 2007, the larger the negative change in stock price will be. I conduct a statistical analysis and ordinary least square regression analyses with a sample of 30 companies to test this hypothesis.

The results of my testing fail to support my hypothesis with statistically significant evidence. Though some companies saw significant changes in stock price in the period surrounding a goodwill impairment announcement, the regression analyses do not display any p-values below the determined significance level. Thus, there is no evidence to suggest that on average the size or timing of goodwill impairment is correlated with stock price fluctuations. Though the conclusiveness of my testing is limited by the small sample size used, the results of my thesis do not suggest that goodwill impairment has a significant effect on stock prices.

Acknowledgements

I would like to thank Professor Matsunaga and Professor Henney for helping me to fully examine the effects of goodwill impairments and consider the various perspectives and contexts related to the stock market. I was incredibly privileged to work with them and am sincerely thankful for their knowledge and guidance throughout the thesis process. I would also like to thank my parents, Jill and Peter Luvaas, for giving me the opportunity to study at the University of Oregon. Without their continuous support I would not have completed this challenging yet rewarding process.

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Introduction

From food prices to real estate values to retirement savings, the value of nearly every aspect of the economy is affected by the health of the stock market. Because of this, the factors that drive stock prices and the repercussions of stock price fluctuations are relevant to a broad section of the general population. Individuals participate in the stock market through investments like retirement plans, savings plans and securities. Also, there are many businesses with dealings and investments in the capital market that depend on a healthy stock market to operate successfully. Despite its relevance to so many aspects of society, predicting the stock market can prove incredibly difficult. Therefore, instead of looking at the market as a whole, it is more practical to study particular trends, such as how economic conditions affect stock prices through reported earnings, in order to anticipate market fluctuations. Investors often use reported earnings as a means to assess a company's future potential. A process called goodwill impairment can have a particularly large impact on reported earnings, reducing them by as much as 96% their total asset value.[1] Because it can so drastically affect earnings, it is important to determine if goodwill impairment is also correlated with stock price fluctuations.

[1] Gannett Company recognized goodwill impairments on October 24, 2008 and January 30, 2009 for $2.491 million and $4.967 billion, respectively, for total goodwill impairment equal to 96% of the company's total assets on December 31, 2008. Data retrieved from Wharton Research Data Services on October 25, 2013.

Goodwill

Goodwill is an asset that is created when one company acquires another and is equal to the excess of the purchase price over the sum of the fair value of the net assets acquired. When a subsidiary is purchased by a parent company, the parent identifies all of the subsidiary's assets and estimates their fair values. The parent company typically pays a greater price for the acquisition than the sum of the identified assets' fair values because it also purchases other intangible assets that cannot be separately identified or valued. These include the subsidiary's reputation, the expertise of its employees, its relationships with customers and suppliers, and its future innovative potential. The sum of these items is represented by goodwill, which is categorized as an intangible asset because it has no physical properties. Goodwill differs from other intangible assets, like copyrights and patents, in that its value is tied to the other assets of the subsidiary and therefore it does not have value on its own and cannot be traded independently. The absence of a market for goodwill makes it very difficult to measure its value.

Because it includes a wide range of factors, goodwill can represent a very large portion of a company's book value, which is the amount recorded on its balance sheet. For example, Symantec Corporation, a company that is included in my thesis sample, had goodwill of $4.5 billion in March of 2009, which accounted for 43% of its total asset value.[2] The value of goodwill is calculated at the time of the acquisition by subtracting the value of the company's net assets from the purchase price that the acquiring company paid. An example of goodwill generation is Kraft Food's purchase

[2] Retrieved from Wharton Research Data Services Compustat Database.

of Cadbury in February of 2010 for $19 billion.[3] The calculation for the recording of goodwill is shown below:

Kraft Acquisition of Cadbury[4]

Purchase Price:	$19 Billion
Cadbury Net Asset Value	$9.5 Billion
Goodwill Book Value	$9.5 Billion

The net asset value is the value of Cadbury's total assets less its total liabilities. The remaining amount of the total purchase price is classified as goodwill and reflects the value of the Cadbury brand, customer and supplier relationships, synergy of Cadbury's departments, and other unidentifiable assets.

After the purchase of a subsidiary, companies record the acquired goodwill on their balance sheet. Because of the difficult nature of valuing goodwill, companies need to decrease the recorded amount if they believe that it will not be realized. This could be caused by many factors, such as changing market dynamics or economic turmoil, that cause intangible asset values to decline. When this occurs, the parent company records a loss for the decrease in value called "goodwill impairment." For example, Time Warner recorded a goodwill impairment related to the acquisition of America On-Line, Inc. (AOL) in the year 2000 after purchasing the company for $180 billion.[5] At the time, the acquisition of AOL by Time Warner was the largest merger in American history, and it

[3] Nytimes.com, (2010). Kraft to Acquire Cadbury in Deal Worth $19 Billion - NYTimes.com. [online] Available at: http://www.nytimes.com/2010/01/20/business/global/20kraft.html?_r=0 [Accessed 24 Mar. 2014].
[4] Sec.gov, (2009). Unaudited Pro Forma Consolidated Financial Information. [online] Available at: http://www.sec.gov/Archives/edgar/data/1103982/000119312510085236/dex991.htm [Accessed 24 Mar. 2014].
[5] Money.cnn.com, (2000). AOL and Time Warner to merge - Jan. 10, 2000. [online] Available at: http://money.cnn.com/2000/01/10/deals/aol_warner/ [Accessed 24 Mar. 2014].

was followed by the largest goodwill impairment ever recorded. The acquisition coincided with the collapse of the so-called "internet bubble" and the establishment of DSL networks, which greatly reduced the value of dial-up service providers like AOL. AOL Time Warner was subsequently forced to incur a record $54 billion impairment of goodwill in its AOL subsidiary after a two-thirds decrease in stock price and increasingly pessimistic valuations of AOL.[6] Impairments can have a substantial effect on a company, as was demonstrated by AOL Time Warner's recorded loss of $99 billion in 2002.[7]

The Goodwill Impairment Process

It is mandatory that companies test for goodwill impairment every year, but there are circumstances that can prompt them to test more often. These are called "triggering events" and can range from increases in competition to stock market slumps—any event or action that could substantially affect a business' operations. The Financial Accounting Standards Board (FASB) codification lists seven different possible triggering events, but the most relevant to my research is "macroeconomic conditions such as a deterioration in general economic conditions, limitations on accessing capital, fluctuations in foreign exchange rates, or other developments in equity and credit markets."[8] The recession that began in 2007, referred to as the "Great

[6] TIME.com, (2014). What AOL time warner's $54 billion loss means - TIME.com. [online] Available at: http://content.time.com/time/business/article/0,8599,233436,00.html [Accessed 24 Mar. 2014].
[7] Wsj.com, (2003). AOL posts a $98.7 billion loss on new goodwill write-down – The Wall Street Journal. [online] Available at: http://online.wsj.com/news/articles/SB1043702683178461304 [Accessed 24 Mar. 2014]
[8] Financial Accounting Standards Board, (2011). Accounting Standards Update – Financial Accounting Standards Board. [online] Available at: http://www.fasb.org/cs/BlobServer?blobcol=urldata&blobtable=MungoBlobs&blobkey=id&blobwhere=1175822937733&blobheader=application/pdf [Accessed May 16, 2013].

Recession," induced all of the above macroeconomic conditions, and therefore it is an ideal period in which to examine goodwill impairments.

Throughout the vast turmoil of the Great Recession it is possible that companies could have recognized various triggering events described by the FASB. However, the occurrence of a triggering event does not necessarily lead to the impairment of goodwill. A 2010 study by the Georgia Tech College of Management examined 40 companies that acknowledged triggering events, only twenty-two of which impaired their goodwill.[9] Both reporting unit valuations and triggering event evaluations leave some room for company discretion and therefore have the potential for debate. Furthermore, the decision to incur an impairment of goodwill can present a dilemma for a company. Managers are often reluctant to impair their company's goodwill because it can signal poor performance and a pessimistic outlook. Additionally, the impairment loss associated with goodwill cannot be reversed, even if values recover in the future. Thus, managers have an incentive to delay the recording of goodwill impairment in the hopes that the decline in value is only temporary.

The goal of my thesis is to analyze the effects of the size and timing of goodwill impairments on company stock prices. Through statistical data analysis I hope to determine whether or not a correlation exists between the timing and magnitude of goodwill impairments and changes in company stock price.

[9] Gatech.edu, (2010). Triggering Events and Goodwill Impairment Charges – Georgia Tech University. [online] Available at: http://scheller.gatech.edu/centers-initiatives/financial-analysis-lab/files/2010/gatechlab_gw_impairment_2010sept23.pdf [Accessed 17 Sept. 2013].

Hypothesis Development

The Relationship Betwqeen Goodwill Impairment and Stock Prices

Stock prices often react to a company's earnings.[10] Earnings are used by investors as an instrument to project future cash flows, which are also factored into the value of stocks. Projected future cash flows are calculated using the discounted cash flows method, which determines the price of a stock by first summing the total cash flows for a company over a given period. This amount is then discounted back from its future value to the present value using the current discount rate to determine the initial price of a stock. Thus the discounted cash flows model demonstrates how expected cash flows can affect stock prices.

The price to earnings ratio, or price earnings multiple, is a common tool used by investors to assess stock value after it is initially set using a model like discounted cash flows.[11] For instance, an earnings multiple of 10 for a stock indicates that investors are willing to pay $10 for every dollar of earnings generated by the company. As earnings estimates change from year to year, so does the price to earnings ratio and, consequently, stock price.

Goodwill impairment reduces earnings because it is recorded as a loss that reduces net income. It can also diminish expectations of future cash flows because it can reflect many aspects of a company's loss of future profitability, including decreased demand for its products and diminished innovative potential that indicate that the book

[10] Ball, R., and P. Brown, [3]An Empirical Evaluation of Accounting Income Numbers, Journal of Accounting Research 6 (Autumn 1968), pp. 159-178.
[11] Spiceland, D., Sepe, J. and Nelson, M. (2011). *Intermediate Accounting*. 6th ed. New York: McGraw-Hill, p.1103.

value of goodwill will not be recovered in the future. When future cash flows decrease, so do stock prices because their value is determined using tools like the discounted cash flows method and price earnings multiple. Because goodwill impairment can affect estimates of future cash flows and earnings, which directly influence stock prices, I expect goodwill impairment to be associated with declines in stock prices.

In times of economic turmoil, such as the Great Recession, goodwill impairments are more common than in times of economic prosperity.[12] Thus, it is possible that investors would expect companies to impair goodwill. If investors expect a goodwill impairment, their reaction will be impounded in the stock price before the impairment is announced. Because the investors' reactions affect the stock price prior to the announcement, it is less likely that stock prices will change after the impairment press release. Economic conditions became more favorable and goodwill impairment less common after the Great Recession, therefore I believe that stockholders are more surprised by later impairments and therefore that later impairments will lead to greater stock price fluctuations.

Goodwill impairment can influence several of the factors that are used to determine stock prices, but it is not clear if stock prices react to goodwill impairment alone. My thesis will analyze this relationship and determine if goodwill impairment has a significant correlation with stock price fluctuations.

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[12] A 2012 study by the Financial Executives Research Foundation found that U.S. companies recognized in aggregate goodwill impairment of $188 billion in 2008, compared to $54 billion and $29 billion in 2007 and 2011, respectively. The year 2008 is recognized by the study as the peak of the Great Recession. Retrieved from:
Duffandphelps.com, (2012). *2012 Goodwill Impairment Study* – Financial Executives Research Foundation. [online]
Available at:
http://www.duffandphelps.com/SiteCollectionDocuments/Reports/2012%20Goodwill%20Impairment.pdf
[Accessed 5 May 2014]

The Great Recession

A recession is defined as a "downward trend in the business cycle characterized by a decline in production and employment, which in turn lowers household income and spending."[13] Though the recession of 2007 was not as severe as the Great Depression of 1929, it was nonetheless the largest economic decline in nearly 80 years. Officially beginning in the fourth quarter of 2007 and lasting through June 2009,[14] the recession was caused by numerous factors, among them the collapse of the housing market bubble which had inflated prices throughout the early- and mid-2000s; the pervasiveness of sub-prime mortgages that banks sold to ill-qualified buyers; and highly leveraged corporate assets which triggered a chain reaction of loan defaults. Once the recession was triggered in September 2007, the economy slipped into a decline that threatened the business of companies in all industries across the country. Companies laid off vast numbers of employees and some, like the investment bank Lehman Brothers Holdings Incorporated,[15] were forced to file for bankruptcy. Over the course of 30 months the national unemployment rate increased by nearly 5%, measuring 9.5% at the end of the recession in June, 2009.[16] The Great Recession was chosen as the beginning of the time frame for my thesis because the poor economic conditions made goodwill impairments more prevalent, and therefore there is a greater sample of impairments to study. My

[13] Merriam-webster.com, (2012). Recession - Merriam-Webster Dictionary. [online] Available at: http://www.merriam-webster.com/dictionary/recession [Accessed 19 Mar. 2014]
[14] Bls.gov, (2012). The recession of 2007-2009 – U.S. Department of Labor Statistics. [online] Available at http://www.bls.gov/spotlight/2012/recession/pdf/recession_bls_spotlight.pdf [Accessed 24 Mar. 2014]
[15] Library.hbs.edu, (1867). History of Lehman Brothers - Lehman Brothers Collection – Baker Library | Bloomberg Center, Historical Collections. [online] Available at: http://www.library.hbs.edu/hc/lehman/history.html [Accessed 24 Mar. 2014].
[16] U.S. Department of Labor Statistics

thesis also includes impairment samples through the year 2013 in order to incorporate varying economic circumstances beyond the recession.

Hypothesis

Goodwill impairment results in the decrease of a company's book value and is generally regarded as an unfavorable adjustment to incur. It follows that public opinion, as represented by stock prices, could react negatively to the impairment depending on the extent to which it reflects new information to investors. I have two parts to my hypothesis. First, I hypothesize that the size of a goodwill impairment has a positive correlation with decreases in stock price. Secondly, I believe that the later the goodwill impairment is incurred relative to the beginning of the Great Recession in September 2007, the larger the negative change in stock price.

Methodology

Sample Selection

1. The Standard & Poor's 500 rankings were retrieved from a Bloomberg Terminal for the date September 30, 2007. The S&P 500 is an index of stock prices on the New York Stock Exchange (NYSE) and National Association of Securities Dealers Automated Quotations (NASDAQ) markets. The index includes 500 of the largest U.S. companies based on market capitalization. The S&P 500 listing from September 30, 2007 is used in my thesis as the initial pool from which impairment examples are drawn because the index is widely regarded as one of the best individual measures of publicly traded stocks.[17]

2. The S&P 500 listing from September 30, 2007 was searched for goodwill impairments incurred between September 30, 2007 and September 30, 2013 using the database Compustat through Wharton Research Data Services. Over this period, there were 385 instances of goodwill impairment recorded by S&P 500 companies. In addition to the amount of goodwill impairment, the companies' total asset and goodwill balances were retrieved from the Compustat database.

3. To scale the goodwill impairments relative to company size, the impairment amounts were divided by the companies' total asset amounts. This standardized the impairments' magnitudes as a percentage of total assets. In order to constrain the data pool to a more concentrated amount of significant goodwill impairments, all impairments that measured less than 5% of total assets were removed from the sample. Approximately 75% of goodwill impairments recorded by S&P companies were smaller than 5% of total assets and excluded from my sample. This resulted in the inclusion of 75 companies with a total of 90 instances of goodwill impairment in my sample. This selection process biases my sample towards larger impairments. However, because my hypothesis concerns the particular effects of impairment magnitude rather than the effects of goodwill impairment in general, I determined that this selection process would be better suited to determining a correlation of impairment size with stock price fluctuations without undermining the integrity of the testing.

17 Us.spindices.com, (2014). S&P 500® - S&P Dow Jones Indices. [online] Available at: http://us.spindices.com/indices/equity/sp-500 [Accessed 24 Mar. 2014].

4. Because of the time commitment associated with manually collecting data, I limited my analysis to a sample of 30 companies. I considered this number to be sufficiently representative of the total population because 30 samples is generally considered a large sample size for statistical testing. The sample size of 30 was also small enough to enable in-depth analysis of each instance of goodwill impairment. Using the random number function of Microsoft Excel, the final pool of 30 goodwill impairments was created, displayed in Table 1 below. Note that the goodwill impairments below represent annual amounts. Therefore some of the values may represent multiple impairments over the course of the year in which the total amount was incurred.

Company	Fiscal Year of Impairment		Annual Impairment Amount (In Millions)	Impairment Amount as Percentage of Total Assets
ADVANCED MICRO DEVICES	2009	$	1,089.00	14%
AUTONATION INC	2008	$	1,756.50	29%
BEST BUY CO INC	2008	$	1,207.00	8%
CIENA CORP	2009	$	455.67	30%
CONOCOPHILLIPS	2012	$	25,443.00	18%
DONNELLEY (R R) & SONS CO	2008	$	800.10	8%
EW SCRIPPS	2008	$	411.01	10%
FIFTH & PACIFIC COS INC	2009	$	693.12	36%
GANNETT CO	2010	$	7,458.05	96%
HARMAN INTERNATIONAL INDS	2008	$	330.56	13%
HILLSHIRE BRANDS CO	2008	$	790.00	7%
HOSPIRA INC	2007	$	400.20	7%
HUNTINGTON BANCSHARES	2009	$	2,606.94	5%
JABIL CIRCUIT INC	2012	$	1,022.82	19%
JONES GROUP INC	2009	$	838.40	35%
LEGG MASON INC	2008	$	734.00	10%
MASCO CORP	2011	$	721.00	9%
MEREDITH CORP	2009	$	294.53	18%
MOLEX INC	2008	$	264.14	9%
MOTOROLA SOLUTIONS INC	2008	$	1,619.00	6%
NOVELL INC	2009	$	270.04	14%
OFFICE DEPOT INC	2011	$	1,269.89	24%
SEALED AIR CORP	2009	$	1,091.00	12%
STAPLES INC	2009	$	771.49	6%
SUN MICROSYSTEMS INC	2008	$	1,445.00	13%
SYMANTEC CORP	2008	$	7,418.57	70%
TEREX CORP	2008	$	459.90	8%
TIME WARNER INC	2012	$	8,217.00	7%
TWENTY-FIRST CENTURY FOX INC	2008	$	8,711.00	16%
TYCO INTERNATIONAL LTD	2009	$	2,705.00	11%

Table 1: Size and Date of Selected Goodwill Impairments

Distribution of Impairments over Time

5. The specific dates and amounts of the impairment announcements were retrieved from online documentation of press releases on the respective company websites, or using the online business database Factiva. Some companies announced multiple impairments over the sample period, causing my procedure to examine more than 30 instances of goodwill impairment. While the occurrence of multiple impairments within a fiscal period complicated the analysis process, it provided an opportunity to determine if stock prices react differently to initial goodwill impairments than they do to subsequent impairments within the same company.

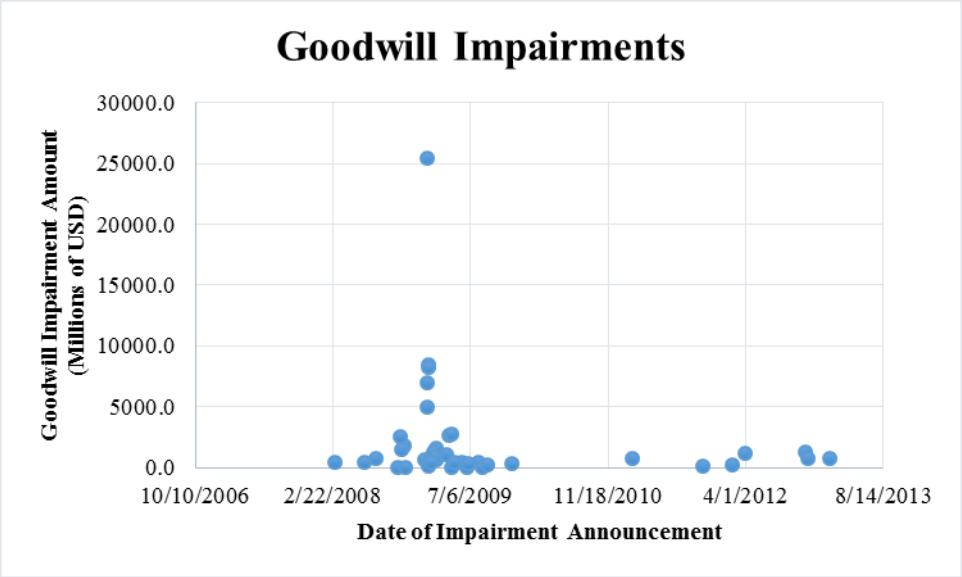

Figure 1: Timing of Goodwill Impairments

Figure 1 shows the timing of goodwill impairments in the selected sample. The majority of goodwill impairments are concentrated in the period between February 2008 and December 2009, in the midst of the Great Recession. Six goodwill impairments are scattered from February 2011 and beyond. Though they were incurred after the official end of the Great Recession, it is possible that these companies impaired goodwill as the result of lingering effects of the economic downturn. This distribution of goodwill impairments demonstrates the extensive effects of the Great Recession and the subjective nature of the timing of goodwill impairment.

Statistical Analysis

6. I conducted a statistical analysis to determine whether stock price fluctuations surrounding the date of goodwill impairment announcement could be attributed to random fluctuations. Daily stock returns (calculated as the percentage change in stock price compared to the previous day) for both the individual companies and the S&P 500 index were retrieved for the 3 months preceding and following the date of the press releases announcing the goodwill impairment using the CRSP database through Wharton Research Data Services. Using Microsoft Excel, I computed the mean and standard deviation for the six-month period surrounding each impairment announcement. This created a sample of approximately 135 days, depending on the number of business holidays during the period, on which to estimate the distribution of stock price changes for each company. For example, for Symantec's goodwill impairment announced January 28, 2009, stock prices were retrieved from October 28, 2008 through April 28, 2009. The mean and standard deviation of the daily stock returns over this period were then calculated.

7. Stock returns are approximately normally distributed, meaning that the likelihood of a price to randomly be located within one, two or three standard deviations from the mean is about 68%, 95%, and 99.7%, respectively. I considered stock prices that were more than two standard deviations (a 5% alpha level) from the mean as statistically significant. Only stock changes over the period two days before to two days after of the goodwill impairment announcement date were considered. I included both tails of the distribution and noted stock price changes that were in the 2.5% probability region above and below the mean.

8. I also compared stock returns to the S&P index returns to test for statistically significant deviation of individual stocks from the S&P index over the same period. After retrieving the daily index prices, the sample's mean and standard deviation was calculated. If a company's daily stock return fell outside of two standard deviations from the S&P 500 mean, the change was determined to be statistically significant. Only daily returns within the period two days prior to and two days after the goodwill impairment announcement date were tested for significance.

9. For my main test, I conducted a regression analysis using the entire sample of 41 goodwill impairments. The dependent variable is the five-day cumulative rate of return surrounding the announcement of the impairment (day t). The cumulative rate of return was calculated using the following formula:

$$[(1+r_{t-2})(1+r_{t-1})(1+r_t)(1+r_{t+1})(1+r_{t+2}] - 1$$

Where *r* is the percentage return for a single day.

I also estimated the regression using a three-day cumulative rate of return as the dependent variable. The narrow 3-day cumulative return window limits the influence of events unrelated to the announcement that affect stock prices at the cost of possibly missing the full impact of the market's response to the announcement.

The independent variables for each regression include the amount of the impairment as a percentage of total assets, the delay in recording the impairment measured as the number of days from September 30, 2007, and an interaction variable calculated by multiplying the magnitude and time delay variables.

10. One concern with the regression procedure outlined above is that the results can be disproportionately influenced by extreme observations. To address this issue, I excluded the outlying smallest and largest goodwill impairments as a percentage of total assets. These were Symantec's goodwill impairment on January 28, 2009 and Huntington Bancshares' goodwill impairment on June 23, 2009.

11. Because the regression in step 8 included all impairments, it is possible that stock return changes could have been diluted by investors' diminished reactions to subsequent impairments. For instance, Symantec incurred a $7 billion goodwill impairment on January 28, 2009 and then on May 5, 2009 recognized a $413 million impairment. Because the first impairment was much larger than the second, it is possible that investors reacted less severely to the second impairment than they would have to a $413 million goodwill impairment on its own. To test if subsequent impairments affect stock prices less than independent impairments, the 5-day and 3-day regression processes from step 8 were repeated, but with a sample including only the initial instances of impairment for each of the 30 companies.

12. The previous regression analyses examined abnormal changes in stock returns compared to the companies' historical stock returns. But these regressions do not account for changes in the S&P 500 index prices, which reflect overall market trends. To analyze stock return changes that account for S&P index trends, the regression analysis process from steps 9 and 10 was repeated using the individual firm stock price adjusted for fluctuations in the S&P 500. The cumulative 5-day and 3-day returns for the S&P 500 Index prices were subtracted from the corresponding cumulative 5-day and 3-day returns for individual firm stocks.

The result of this difference was used as the y-value for the regression analysis, while the x-values of impairment magnitude, days passed, and interaction variable between impairment magnitude and days remained the same.

Results

As displayed in Table 2 on the following page, 13 of the 30 companies (15 of the 41 total impairments) from the sample had statistically significant stock price changes within five days of the announcement of the goodwill impairment. Table 2 below also displays whether or not the abnormal stock price change within the 5-day period was a positive or negative change in return.

Company	Date	Goodwill Impairment Amount (In Millions)	Stock Price Change
Symantec	1/28/2009	$ 7,005.00	Positive
Symantec	5/6/2009	$ 413.00	Negative
Harman	2/4/2009	$ 325.45	Negative
Gannett	10/24/2008	$ 2,491.00	Positive
Gannett	1/30/2009	$ 4,967.00	Negative
Office Depot	2/24/2009	$ 1,269.89	Negative
Masco	2/14/2011	$ 721.00	Negative
Scripps	2/29/2008	$ 411.01	Negative
Ciena	6/4/2009	$ 455.67	Positive
Hospira	2/14/2012	$ 245.00	Positive
Sun Microsystems (Oracle)	10/31/2008	$ 1,445.00	Negative
Terex	2/11/2009	$ 459.90	Negative
Tyco	4/30/2009	$ 2,705.00	Positive
Best Buy	3/29/2012	$ 1,207.00	Negative
Legg Mason	2/1/2013	$ 734.00	Negative

Table 2: Significant Stock Return Fluctuations

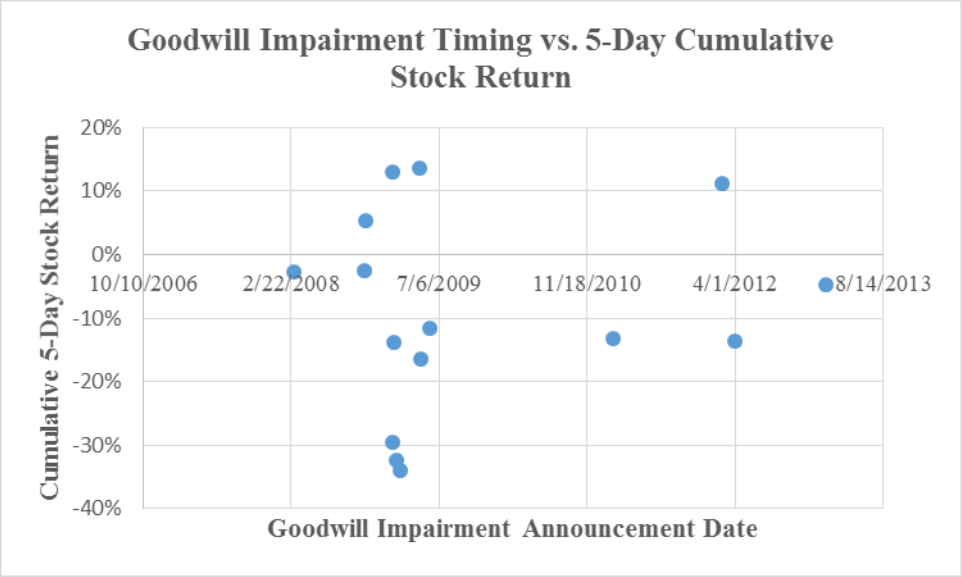

Figure 2: Timing of Significant Stock Return Fluctuations

The following tables and figures display the results from the five different regression analyses conducted using the regression data analysis tool in Microsoft Excel. Though many statistics are listed for each results section, the most pertinent for the discussion of the impact of goodwill impairment are the coefficients, t-statistic, and associated p-value. Following each results display is a translation of those statistics into the context of the impact of goodwill impairments on stock price. An alpha level of $\alpha = .05$ and p-value of .10 or lower was used to determine significant values.

Regression Analysis: Cumulative 5-Day Return (Whole Sample)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.302831882
R Square	0.091707149
Adjusted R Square	0.018061782
Standard Error	0.129071849
Observations	41

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	0.062236058	0.020745353	1.245253479	0.307253974
Residual	37	0.61640306	0.016659542		
Total	40	0.678639118			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.109062877	0.066363199	-1.643424055	0.108767583	-0.243527491	0.025401736	-0.243527491	0.025401736
Impairment/Total Assets	0.383953181	0.576354516	0.666175367	0.509431576	-0.783851996	1.551758359	-0.783851996	1.551758359
Days	0.000134942	0.000101991	1.323084307	0.193926091	-7.17106E-05	0.000341595	-7.17106E-05	0.000341595
Impairment/Total Assets and Days Interaction	-0.00104205	0.001103302	-0.944483167	0.35104991	-0.003277551	0.001193452	-0.003277551	0.001193452

Table 3: Regression Results Cumulative 5-Day Return Whole Sample

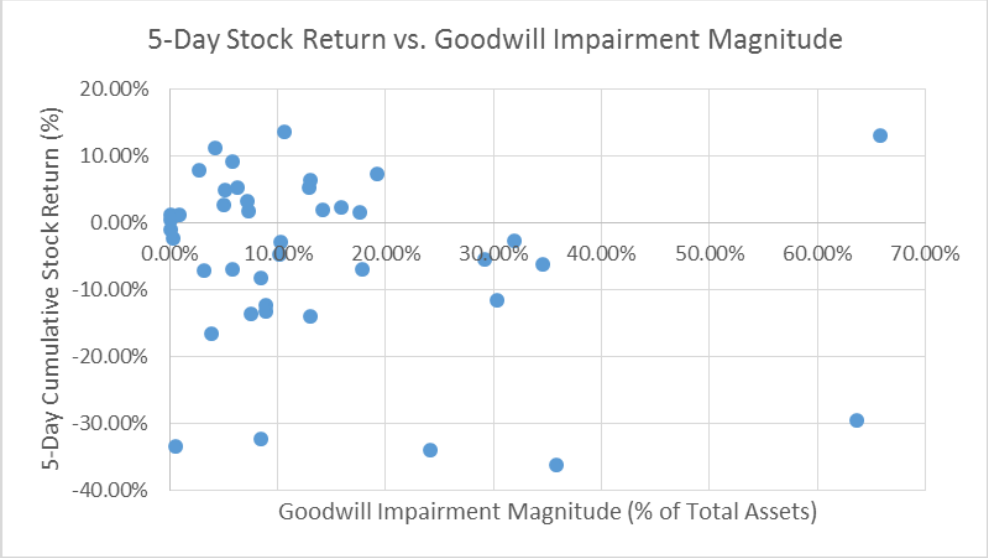

Figure 3: Cumulative 5-Day Return Whole Sample and Impairment Magnitude Correlation

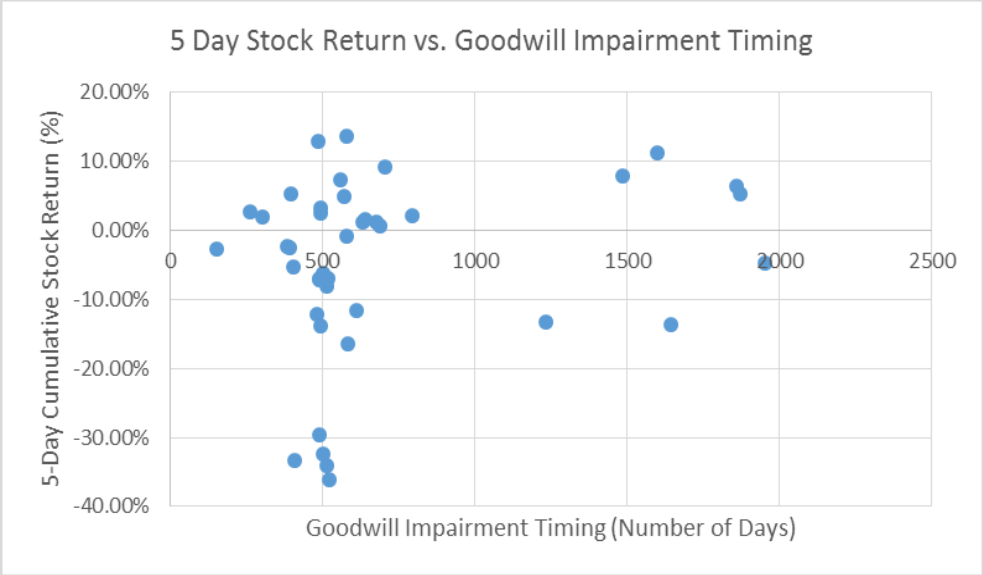

Figure 4: Cumulative 5-Day Return Whole Sample and Impairment Timing Correlation

These results display the relationship between individual firm stock returns and the size of goodwill impairment and the length of time that has passed expressed as a number of days since September 30, 2007. Because an alpha level of $\alpha = .05$ requires the p-value for a regression variable to be less than .10 in order to be statistically significant, these results do not support the hypothesis that stock returns are affected by goodwill impairments. For example, the p-value for the "Impairment/Total Assets" x-variable is .51. This means that there is a 51% chance that the results of this regression are due to random chance, a probability that is too high to draw any conclusions about a correlation between stock return changes and the size of goodwill impairments. The p-values for the other two x-variables are similarly high, and thus the results do not support my hypothesis.

Regression Analysis: Cumulative 3-Day Return (Whole Sample)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.200465616
R Square	0.040186463
Adjusted R Square	-0.037636256
Standard Error	0.117263364
Observations	41

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	0.021301949	0.00710065	0.516384722	0.673571396
Residual	37	0.508775773	0.013750697		
Total	40	0.530077722			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.082165266	0.060291783	-1.362793752	0.181184824	-0.204328023	0.039997491	-0.204328023	0.039997491
Impairment/Total Assets	0.204786428	0.523625176	0.391093549	0.69797119	-0.856178956	1.265751813	-0.856178956	1.265751813
Days	8.05121E-05	9.26599E-05	0.868899656	0.390503583	-0.000107235	0.000268259	-0.000107235	0.000268259
Impairment/Total Assets and Days Interaction	-0.000516081	0.001002363	-0.514864521	0.609709973	-0.002547062	0.001514899	-0.002547062	0.001514899

Table 4: Regression Results Cumulative 3-Day Return Whole Sample

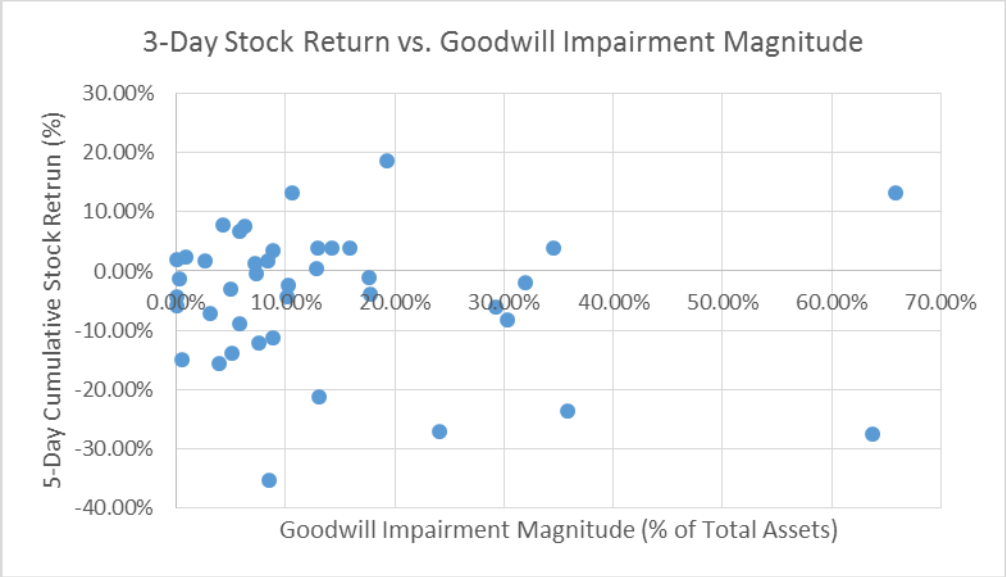

Figure 5: Cumulative 3-Day Return Whole Sample and Impairment Magnitude Correlation

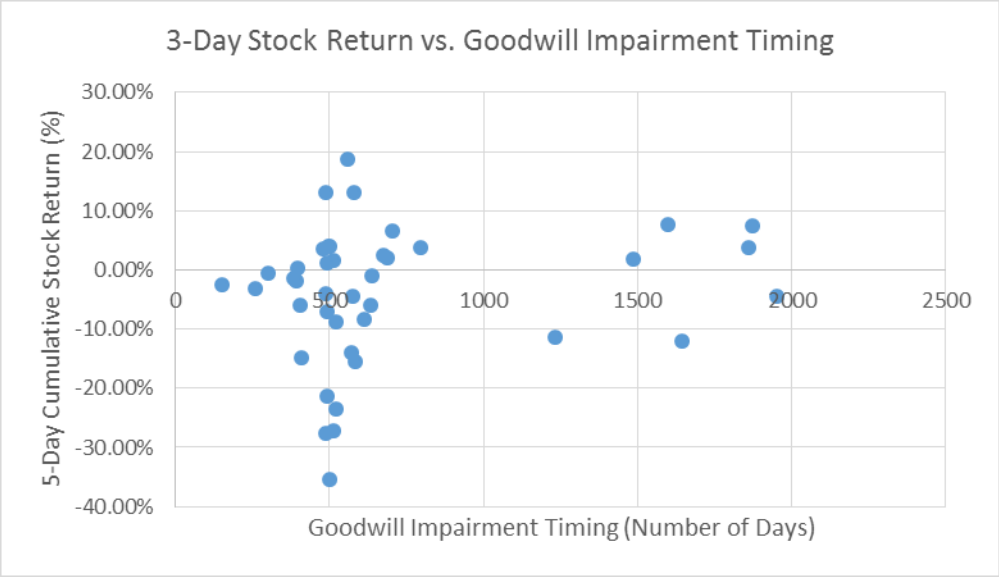

Figure 6: Cumulative 3-Day Return Whole Sample and Impairment Timing Correlation

To help compensate for the possibility that other factors could have also affected stock prices in the days surrounding the impairment announcement, the cumulative return was narrowed to the three days surrounding the press release in order to concentrate the regression y-values. This analysis uses the same x-variables as the previous 5-day regression, and has similar results. The p-values for all three x-variables are greater than the alpha level, and therefore the results do not support the hypothesis that stock returns are correlated with goodwill impairments.

Regression Analysis: Cumulative 5-Day Return (Without Outliers)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.433912123
R Square	0.18827973
Adjusted R Square	0.118703707
Standard Error	0.121987784
Observations	39

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	0.120808615	0.040269538	2.706100781	0.060124068
Residual	35	0.520835679	0.014881019		
Total	38	0.641644294			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.074262627	0.06448018	-1.151712459	0.257246024	-0.205164352	0.056639098	-0.205164352	0.056639098
Impairment/Total Assets	0.030168757	0.562326627	0.053649882	0.957519179	-1.111414986	1.1717525	-1.111414986	1.1717525
Days	0.000107635	9.70258E-05	1.109341106	0.274847408	-8.93381E-05	0.000304607	-8.93381E-05	0.000304607
Impairment/Total Assets and Days Interaction	-0.000757375	0.001050532	-0.720944113	0.475732181	-0.002890068	0.001375318	-0.002890068	0.001375318

Table 5: Regression Results Cumulative 5-Day Return Without Outliers

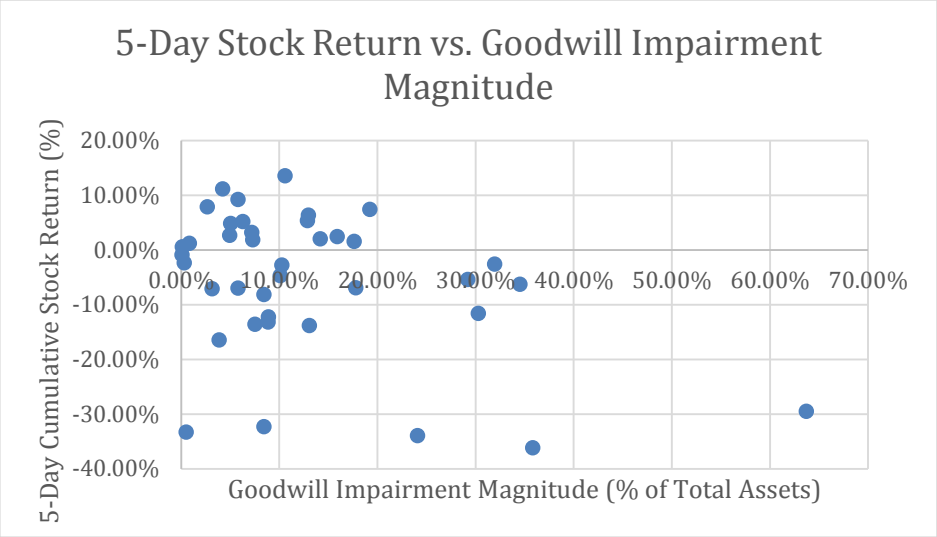

Figure 7: Cumulative 5-Day Return Without Outliers and Impairment Magnitude Correlation

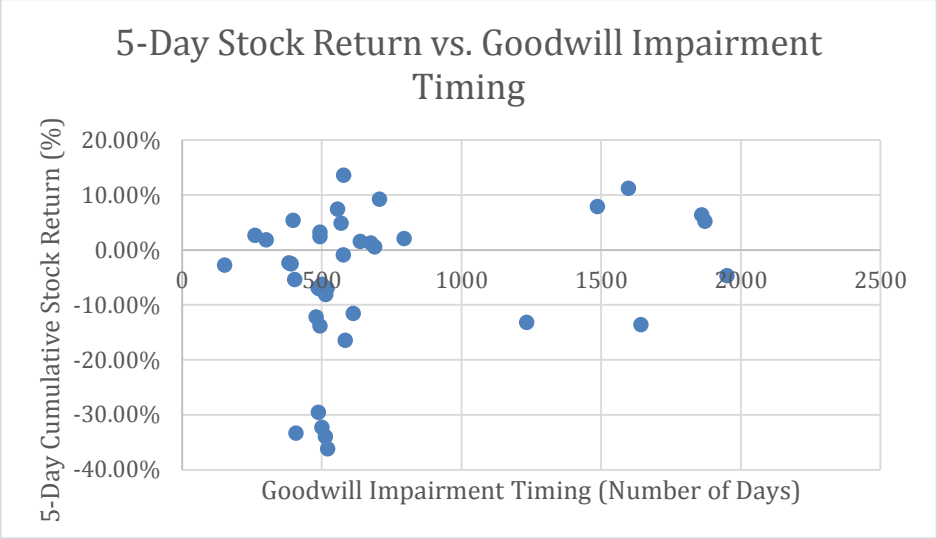

Figure 8: Cumulative 5-Day Return Without Outliers and Impairment Timing Correlation

To compensate for the possibility that outliers were distorting the correlation between the variables in the previous regressions, the largest and smallest goodwill impairments as a percentage of total assets were removed from the regression. The p-values were greater, however, than the regression which included the outlying goodwill impairment instances and thus do not suggest any relationship between stock returns and goodwill impairments.

Regression Analysis: Cumulative 3-Day Return (Without Outliers)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.330511521
R Square	0.109237865
Adjusted R Square	0.032886825
Standard Error	0.112772279
Observations	39

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	0.05458637	0.018195457	1.430731855	0.250312954
Residual	35	0.445115542	0.012717587		
Total	38	0.499701913			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.05169627	0.059609058	-0.867255278	0.391709375	-0.172709091	0.069316551	-0.172709091	0.069316551
Impairment/Total Assets	-0.07592423	0.519845949	-0.146051402	0.884718766	-1.131267613	0.979419153	-1.131267613	0.979419153
Days	6.00213E-05	8.9696E-05	0.669163638	0.507781403	-0.000122071	0.000242114	-0.000122071	0.000242114
Impairment/Total Assets and Days Interaction	-0.000318971	0.00097117	-0.328440017	0.744535995	-0.002290551	0.001652609	-0.002290551	0.001652609

Table 6: Regression Results Cumulative 3-Day Return Without Outliers

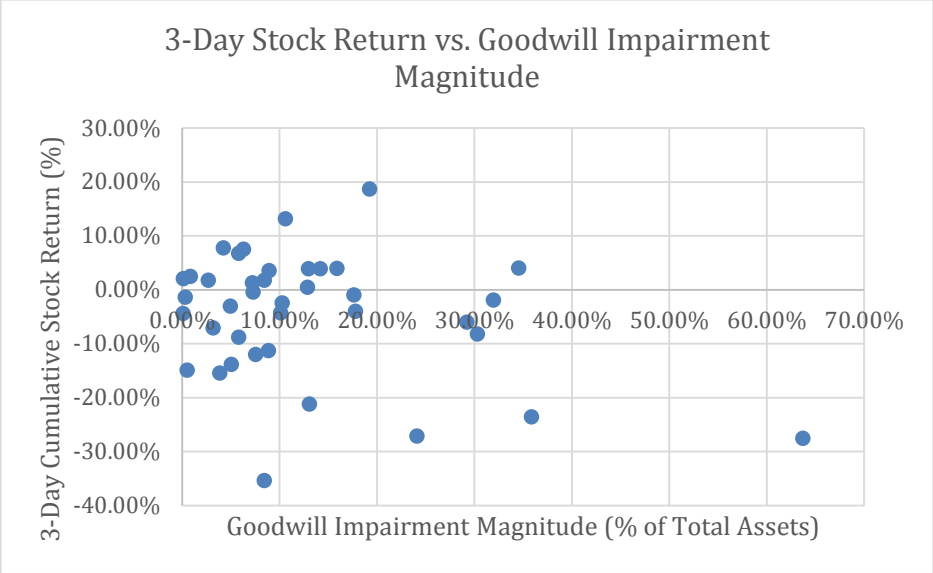

Figure 9: Cumulative 3-Day Return Without Outliers and Impairment Magnitude Correlation

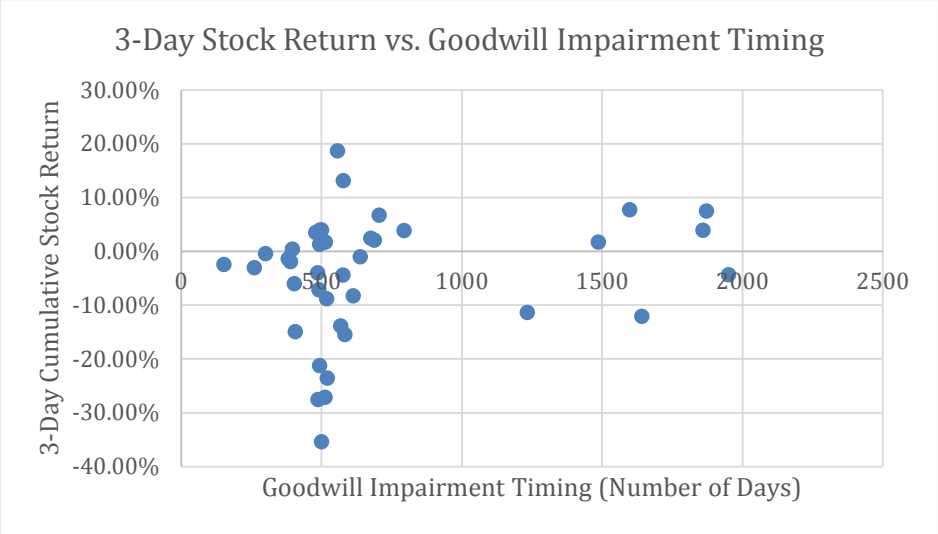

Figure 10: Cumulative 3-Day Return Without Outliers and Impairment Timing Correlation

A 3-day cumulative return y-variable was used in this regression to focus the response of stock prices to goodwill impairments. The p-values for all three x-variables were .50 or greater, causing this regression to fail to support my hypothesis.

Regression Analysis: Cumulative 5-Day Return (First Impairment Only)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.246004315
R Square	0.060518123
Adjusted R Square	-0.047883632
Standard Error	0.126278396
Observations	30

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	0.026707209	0.008902403	0.558276229	0.647285803
Residual	26	0.414602063	0.015946233		
Total	29	0.441309271			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.125410077	0.075630862	-1.658186526	0.109297881	-0.280871541	0.030051387	-0.280871541	0.030051387
Impairment/Total Assets	0.491333923	0.632328733	0.777022927	0.444157785	-0.808436402	1.791104247	-0.808436402	1.791104247
Days	9.50216E-05	0.00011601	0.819083431	0.420183666	-0.00014344	0.000333483	-0.00014344	0.000333483
Impairment/Total Assets and Days Interaction	-0.000622456	0.001207664	-0.515421261	0.610613701	-0.003104844	0.001859933	-0.003104844	0.001859933

Table 7: Regression Results Cumulative 5-Day Return First Impairment Only

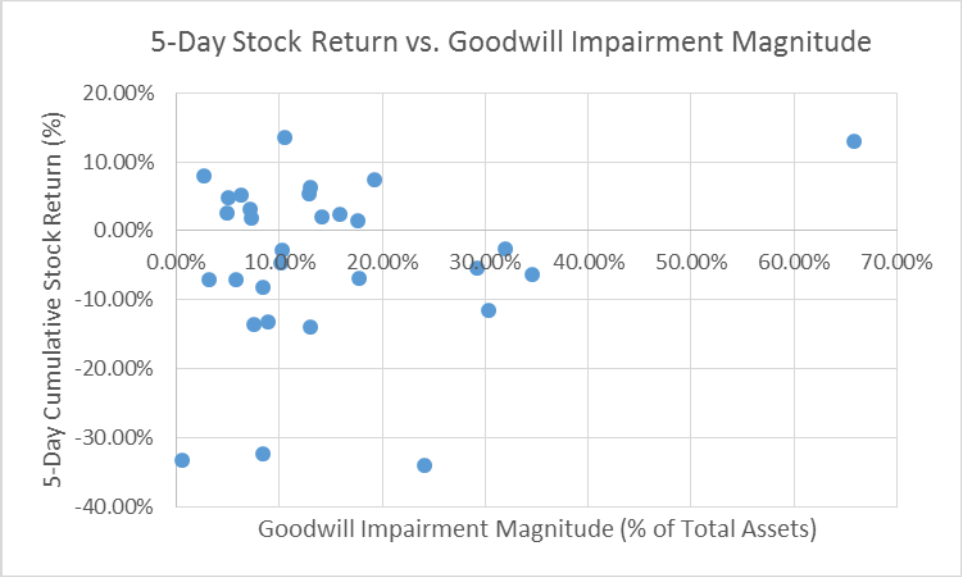

Figure 11: Cumulative 5-Day Return First Impairment Only and Impairment Magnitude Correlation

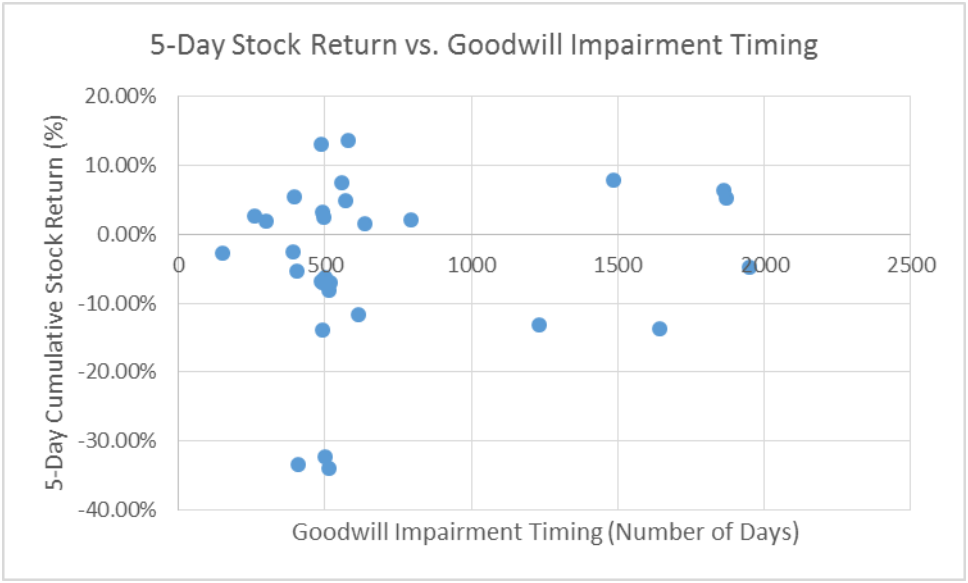

Figure 12: Cumulative 5-Day Return First Impairment Only and Impairment Timing Correlation

To isolate the response of stock prices to the first goodwill impairment, all subsequent impairments announced by each firm were removed from the regression sample. By only including the initial impairment, all companies represented an equal weight in the regression analysis. The p-values for each x-variable remained above .10,

and therefore the regression does not support the hypothesis that stock price changes are related to goodwill impairment.

Regression Analysis: Cumulative 3-Day Return (First Impairment Only)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.310961712
R Square	0.096697186
Adjusted R Square	-0.007530061
Standard Error	0.115367491
Observations	30

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	0.037044243	0.012348081	0.927753429	0.441290081
Residual	26	0.346051109	0.013309658		
Total	29	0.383095351			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.11235413	0.069096086	-1.626056357	0.115998969	-0.254383168	0.029674909	-0.254383168	0.029674909
Impairment/Total Assets	0.369140565	0.577693272	0.638990591	0.52841877	-0.818324962	1.556606092	-0.818324962	1.556606092
Days	5.68515E-05	0.000105986	0.536405569	0.596238499	-0.000161006	0.000274709	-0.000161006	0.000274709
Impairment/Total Assets and Days Interaction	-0.000218482	0.001103317	-0.198023028	0.844567195	-0.002486383	0.002049419	-0.002486383	0.002049419

Table 8: Regression Results Cumulative 3-Day Return First Impairment Only

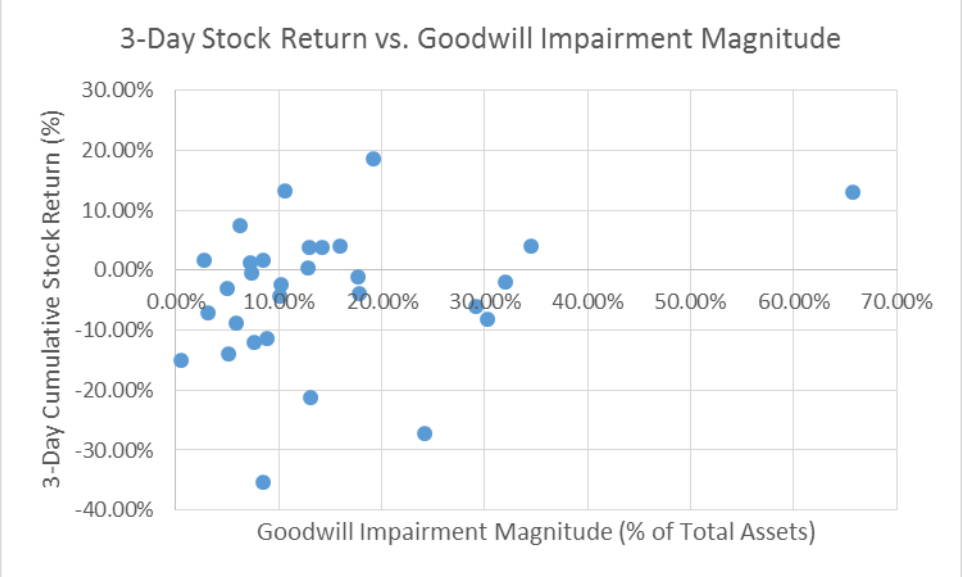

Figure 13: Cumulative 3-Day Return First Impairment Only and Impairment Magnitude Correlation

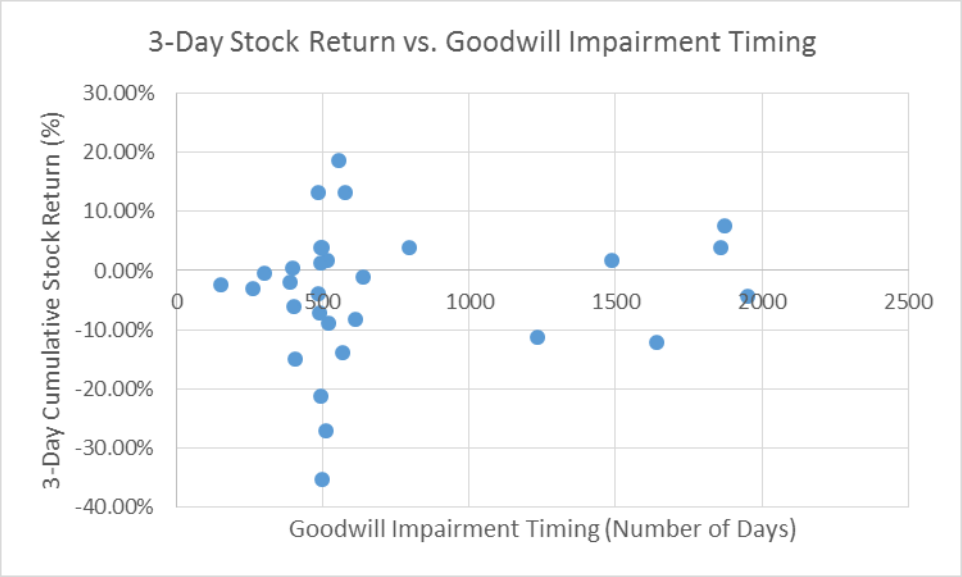

Figure 14: Cumulative 3-Day Return First Impairment Only and Impairment Timing Correlation

A cumulative 3-day stock price regression which narrows the timeline around the date of goodwill impairment announcement also has p-values above the statistically significant level for all x-variables. Because none of the p-values fall below .10, this regression fails to support my hypothesis.

Regression Analysis: Cumulative 5-Day Return (Adjusted Firm Return)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.224687821
R Square	0.050484617
Adjusted R Square	-0.026503117
Standard Error	0.037350863
Observations	41

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	0.00274448	0.000914827	0.655748835	0.584482501
Residual	37	0.051618218	0.001395087		
Total	40	0.054362698			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.012419235	0.019204209	-0.646693398	0.521822148	-0.051330659	0.026492188	-0.051330659	0.026492188
Impairment/Total Assets	0.013992879	0.166785699	0.083897352	0.933590336	-0.323947049	0.351932806	-0.323947049	0.351932806
Days	1.98475E-05	2.95141E-05	0.672475673	0.50545914	-3.99538E-05	7.96489E-05	-3.99538E-05	7.96489E-05
Impairment/Total Assets and Days Interaction	-8.70384E-05	0.000319274	-0.272613544	0.786666021	-0.000733949	0.000559872	-0.000733949	0.000559872

Table 9: Regression Results Cumulative 5-Day Adjusted Return

After running six different regressions without resulting p-values below the significance level of .10, a regression was performed with a set of new y-values calculated by subtracting the cumulative S&P 500 return from the individual firm return over the same period. The x-variables remained constant from previous regressions. This adjusted firm return compensates for trends in the overall S&P 500 that may have distorted the changes in the individual returns. However, no p-value was determined significant, and therefore the regression does not support my hypothesis.

Regression Analysis: Cumulative 3-Day Return (Adjusted Firm Return)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.237957176
R Square	0.056623618
Adjusted R Square	-0.019866359
Standard Error	0.031180503
Observations	41

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	0.002159139	0.000719713	0.740274999	0.534828347
Residual	37	0.035972279	0.000972224		
Total	40	0.038131418			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.000239889	0.016031675	-0.014963445	0.988141741	-0.032723148	0.03224337	-0.032723148	0.03224337
Impairment/Total Assets	-0.10875095	0.139232713	-0.781073266	0.439728586	-0.390863223	0.173361323	-0.390863223	0.173361323
Days	-4.64344E-06	2.46384E-05	-0.188463713	0.85154306	-5.45656E-05	4.52787E-05	-5.45656E-05	4.52787E-05
Impairment/Total Assets and Days Interaction	0.000146839	0.00026653	0.550929985	0.584993263	-0.000393201	0.00068688	-0.000393201	0.00068688

Table 10: Regression Results Cumulative 3-Day Adjusted Return

To narrow the scope of the regression, a 3-day cumulative return was used with the adjusted firm return as the y-variable. None of the p-values were lower than the statistically significant level of .10.

Conclusions

Although goodwill impairments are generally recognized as unfavorable for a company to announce and recognize, the results of the regression analyses do not support my hypothesis that, on average, the size and delay in timing of goodwill impairments have a statistically significant positive correlation with decreases in stock prices. However, I also find evidence that the disclosure of goodwill impairment is an important information event for certain companies. I find 43% of companies and 36% of total impairments showing statistically significant reactions within 5 days of the press release announcement of goodwill impairment. This indicates that, in certain instances, companies experience significant changes in stock prices in the time period surrounding the announcement of goodwill impairment. However, given that less than half of the companies experienced significant stock price changes over the 5-day period, this test does not provide enough evidence to support my hypothesis. Furthermore, 5 of the 15 companies recognized statistically unusual positive changes in stock returns within the 5-day window of impairment announcement. For example, Symantec's $7 billion goodwill impairment, the largest in the sample of 41 total impairments, saw an abnormally positive change in stock price the day after the announcement on January 28, 2009.

One explanation for the lack of reaction to goodwill impairment is that the impairment was expected by investors due to poor economic conditions, and the reaction was impounded in the stock price before the impairment was announced. Another possible explanation is that there were other events or indicators that caused a positive stock price reaction at the same time as the goodwill impairment, offsetting the

negative reaction to the impairment. While this study of individual stock fluctuations reveals that abnormal changes sometimes occur in periods surrounding goodwill impairment announcements, the regression testing must be analyzed to determine whether or not an overall correlation exists between stock price change and goodwill impairment.

My regression testing was composed of 8 ordinary least squares regression analyses which tested 3 x-variables: impairment magnitude, impairment timing, and a magnitude and timing interaction variable. The regressions analyzed the correlation of 24 different x- and y-variable relationships, but no p-values fell below the statistical significance mark of 0.10. None of the p-values for any of the three different x-variables fell below 0.19 in any regression, meaning that none of the correlation coefficients can be reliably distinguished from random chance. These results indicate that considering the 30 companies and the 41 instances of goodwill impairment that my testing included, there is little evidence to support the hypothesis that on average a correlation exists between stock price changes and goodwill impairment.

Both the initial stock price change testing and the regression analyses fail to support both parts of my hypothesis: the size of goodwill impairments has a positive correlation with decreases in stock price and the length of delay in timing of the impairment has a positive correlation with stock price decreases. It should be noted that, because of data requirement reasons, my analysis had a small sample size of 30 and limited degrees of freedom. Therefore the power of the statistical testing was restricted. After finding a lack of evidence to support my hypothesis, I realize that it may have been more revealing to study goodwill impairment effects on stock prices in

times of economic prosperity, such as during the technology boom of the mid-1990s. However, the study of this time period would likely be restricted by the ability to obtain a sample large enough to draw any significant conclusions from the data, since there tend to be substantially fewer goodwill impairments in strong economic conditions than weak ones.

The Importance of this Thesis

Examining changes in stock prices is the only consistent method available to reveal the reaction of investors to goodwill impairments, but it is limited by its ability to isolate various factors that influenced the changes in stock returns. However, the results of the regression analysis and the rejection of my hypothesis suggest that when impairments are common in the contemporary economic circumstances, investors do not consider their announcement as a significant factor in investing decisions. It is possible that the abundance of goodwill impairments caused investors to not be surprised by, or possibly to even expect, impairments of goodwill. This thought process would have led to little change in stock price in reaction to the goodwill impairments. Another possibility is that the impact of goodwill impairment was overshadowed during the recession by other more prominent indicators of investment potential and company health. During the Great Recession many markets and industries saw drastic fluctuations in stock prices, and it is possible that investors saw other opportunities for or threats to investments that outweighed their consideration of goodwill impairment effects.

The results of my methods can only reject the hypothesis that changes in stock prices are correlated with the size and timing of goodwill impairments. Because stock

prices reflect only a shallow insight into the thoughts and motives of investors, the true influences on stock prices and the weight of their impact on daily returns are extremely difficult to isolate and measure. The stock market is an incredibly complex and sensitive measure of countless economic, legal, political, and social factors that can all have varying influences simultaneously. Company stock prices can see drastic changes within a single day, sometimes for no apparent reason. Consistently predicting stock market trends is next to impossible because of the abundance of uncertainty and variability in the factors that influence it. Along with rejecting my hypothesis, the results of my analysis support the idea that the stock market is unpredictable and its behavior can defy logic.

Because of the limited sample size of my analysis, my thesis leaves room for more extensive research of the relationship between goodwill impairment and stock price changes. Future research with more time and resources would be beneficial to investigating specific effects of individual impairments on stock prices, such as why some companies saw increases while others saw decreases in stock prices after announcing goodwill impairments. While my thesis does not make definitive conclusions regarding goodwill impairments and stock price fluctuations, it does offer insight into the complexities of the relationship between accounting processes and the general public.

The stock market is perhaps the most prevalent indicator of economic health. Its influence on businesses and individuals around the world is difficult to overstate, as its fluctuations impact many aspects of our daily lives. Economic recessions affect all businesses and can cause almost any company to go bankrupt. It is because of this

profound, volatile, and extraordinary strength that the stock market and its behavior is worth studying. The functioning of the stock market is so complex that it is most effective to evaluate the factors that do not influence it rather than that which do have an impact. The results of my analysis and the rejection of my hypothesis demonstrates that goodwill impairment, a process that can cause companies to lose millions or even billions of dollars in value, does not have a statistically demonstrable correlation with changes in stock price. Therefore, given the extensive impact of the stock market in our society, there is not significant evidence that goodwill impairments substantially affect citizens without a direct interest in the impaired companies.

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