An Empirical Analysis of Merger-Related Blog Posts

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Abstract
Financial blogs are maintained by individuals (investors) in order to share information and opinions about financial topics and events, such as merger attempts. A merger attempt represents a situation of uncertainty for investors, because a lot of merger attempts are unsuccessful. Using a computer-assisted approach for content analysis of textual data, this study aims to explore if blog posts reflect the uncertainty concerning the final result of a merger attempt during the time period between the public announcement of a merger and the date of completion/withdrawal of a merger attempt. The results provide evidence that blog posts that are related to a failed merger attempt reflect more uncertainty, show less optimism, and reflect more signs of failure compared to successful merger attempts. This shows that information exchange in social media can serve as an indicator for other financial phenomena besides capital market reactions.

Keywords: Social Media and Blogs, M&A, Merger, Uncertainty, Content Analysis

1 Introduction
Blogs are a type of social media. At the end of 2011, it was estimated that 173 million blogs exist, with an estimated rate of growth of about 175,000 new blogs per day (statista.com). Amongst others, financial topics and financial events, such as mergers, are frequently discussed on the internet in blogs. On financial blogs, individual investors provide financial relevant information, ranging from personal opinions and investment recommendations to specific analyses. In general, investors make use of social media in order to gather reliable information. In particular, blogs can play a critical role as an information source during the decision making process of investors.

Previous studies that investigate the role of social media in the financial domain primarily have been concerned with the predictive power of online information exchange with respect to the market reaction (Das & Chen, 2007; Antweiler & Frank, 2004; Wysocki, 1998; Fotak, 2008). Nevertheless, none of these studies has investigated if the textual information provided by blogs and other types of social media can be used as an indicator for other financial phenomena besides capital market reactions. This study aims to fill this gap by exploring blog posts in the event of a merger attempt and is, to the best of my knowledge, the first of its kind.
A merger is the combination of two separate organizations that merge into a single legal entity (SEC, 2013) and is primarily driven by strategic, managerial, and financial motives (Napier, 1989). Due to the severe price reaction subsequent to the announcement of a merger, a merger represents an event of great relevance for investors that have invested or are going to invest in either one of the involved parties (Dodd, 1980). Consequently, investors have to reassess their investment decisions and have to evaluate the synergetic gains of the merger attempt (Louis & Sun, 2010). Nevertheless, an important fact remains: a lot of merger attempts are unsuccessful (Chakravorty, 2012). Therefore, my research question is as follows:

*Do blog posts reflect the merger-related uncertainty concerning the completion of a merger attempt?*

The remainder of the paper is structured as follows. In the next section, I provide a review of the relevant literature, including the general hypothesis. Then, I present the study setup which comprises a description of the dataset and my research approach. In the following section, I formulate the research hypotheses and present the empirical results. I finally conclude with a summary of my findings, the limitations of my research and potential future research directions.

## 2 Literature Review and Hypotheses Development

### 2.1 Blogs

Blogs are “frequently updated websites where content (text, pictures, sound files, etc.) is posted on a regular basis and displayed in reverse chronological order” (Schmidt, 2007, p. 1409). Furthermore, blogs are a specific type of social media. Social media can be defined as “a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content” (Kaplan & Haenlein, 2010, p. 61). Many motives do exist for people to maintain a blog. Nardi et al. (2004) identified five motives for people to blog: documenting one's life, providing commentary and opinions, expressing deeply felt emotions, articulating ideas through writing, and forming and maintaining community forums. Many classification schemes have been proposed in the literature, an overview of blog typologies is provided by Silva et al. (2008).

In general, blogs are considered as a reliable source of information that is less biased by conflicting interests (The Nielsen Company, 2007). In particular, in the financial domain, blogs are commonly used as a source of financial related information and as a means for information exchange. Financial blogs do not only cover most recent events in the financial domain, but also provide analysis and investment recommendations. They are not primarily maintained by individual investors who want to share their personal opinions on financial topics. In some cases, financial blogs are also maintained by professional financial websites, a famous example is “Yahoo! Finance Blogs”. In the financial context, Fotak (2008) investigated the relation between stock recommendations on financial blogs and market reactions. He found that financial blogs are mostly concerned with high liquid stocks. Furthermore, he found that financial blogs seem to influence trading volumes and stock prices with respect to the recommended stocks. Therefore, blog recommendations have predictive power with regard to their accuracy of their recommendations. In addition, Zülch (2013)
analysed information processing activities on blogs with regards to merger attempts. He used characteristics and structure of a merger transaction as proxies for the uncertainty concerning the completion likelihood of a merger. In so doing, he showed that the merger-related uncertainty can be related to information processing activities on blogs. In this sense, my study aims to extend his findings by analysing if the textual information provided by blogs reflects the merger-related uncertainty. Overall the literature on blogs in the financial context illustrates that blogs, as a type of social media, play an influential role in the financial domain.

2.2 Merger and Uncertainty

In this study I aim to explore if the content of blog posts reflects the uncertainty concerning the final result of a merger attempt during the time period between the date of announcement of a merger and the date of completion/withdrawal. Galbraith (1973) generally defines uncertainty as the difference between the amount of information possessed and the amount of information required. Furthermore, uncertainty “is the inability to predict future outcomes or states of the world” (Galbraith, 1978, p. 36). Uncertainty is also based on imperfect knowledge with respect to environmental and situational factors (Duncan, 1972). Generally, information asymmetries do exist between investors and the management of organizations (insiders) (Healy & Palepu, 2001). Hence, investors experience informational uncertainties compared to insiders in any case. In addition, the outcome of an announced merger attempt is uncertain; therefore investors and authors of financial blogs experience also additional uncertainty concerning the completion of a merger.

Mergers and acquisition (M&A) activities of organizations are based on several motives that range from strategic and managerial to sheer financial ones (Napier, 1989). The term M&A includes several types of transactions, ranging from the acquisition of a minority stake in a target company by another company to the merging of two previously separate companies. In particular, mergers are “business combination transactions involving the combination of two or more companies into a single entity” (SEC, 2013). They represent a growth opportunity, especially for external growth, and can increase or enable synergies, for example via economies of scale and scope (Chakravorty, 2012; Halpern, 1983), whereby the terms ‘merger’ and ‘acquisition’ are often used interchangeably (Chakravorty, 2012). A merger may also involve acquiring all shares of a target company and is in that case officially declared as a merger, but is in fact an acquisition in economic terms (Faulkner et al., 2012).

A merger passes through several phases from the initial offer by one organization to another organization to the legal unification of both organizations before the completion of the merger is announced. At first, after both involved parties have negotiated on the terms of the merger, an official announcement of the merger proposal is made. In the U.S., the SEC further specifies that mergers have to “be approved by at least a majority of a company's shareholders if the merger will have a significant impact on either the acquiring or target company” (SEC, 2013). In addition, governmental and regulatory authorities usually also have to give their approval to the merger. Governmental and regulatory authorities will examine if the merger violates any antitrust laws.

The described high-level merger process shows that during several stages of a merger attempt, an abandonment of the merger is possible. Either the management of one of the involved parties does abandon the merger attempt, or the merger is not approved by shareholders, or governmental and regulatory authorities. Therefore, investors, who are invested and/or are
considering to invest in at least one of the involved parties, face uncertainty concerning the final outcome of a merger attempt during the whole merger process from the date of the public announcement of a merger to the date of the final outcome of the merger attempt. In the remainder of the paper, I refer to the uncertainty concerning the outcome of a merger attempt.

A merger announcement represents a very relevant event for investors, because of its direct and significant impact on share prices. Many studies analyzed the relationship between the announcement of a merger and the corresponding market reaction (Dodd, 1980; Asquith, 1983; Kau et al., 2008). In particular, some studies investigated the relationship between the market reaction subsequent to a merger announcement and the probability of a merger being completed (Kau et al., 2008; Luo, 2005). They find that the management of public companies does listen to the market, meaning that the management extracts information from the market reaction, and is consequently likely to cancel a merger when the market reacts adversely after the public announcement of the merger. Asquith (1983) examined abnormal stock returns throughout the merger process, from the public announcement of a merger up to the final outcome of a merger attempt (completion/withdrawal of the merger attempt). Furthermore, the market reaction throughout a merger process for the target firm reflects the probability of a merger. Newly available information during a merger process is reflected by share prices, and thus, representing the current amount of uncertainty (Asquith, 1983).

Other studies have been concerned with the characteristics of a merger and the structure of the deal in relation to the probability of merger completion (Muehlfeld et al., 2007; Walking, 1985; Bates & Lemmon, 2003). They find that the probability that a merger attempt is successful is affected by the chosen method of payment and the deal attitude (i.e. hostile or friendly offer). In a hostile merger attempt the target company’s management does not approve the merger and may employ several defensive tactics to counteract a takeover attempt (e.g. white knight; poison pills, or macaroni defense).

Other factors, like for example the existence of a termination fee agreement, can decrease the uncertainty concerning the outcome of a merger attempt. In a merger agreement, a termination fee clause “entail a contingent payment by one party to a counter party and are triggered when the former dissolves the agreement” (Bates & Lemmon, 2003). Hence, acquiring company and target company provisions for termination fees in the event that the merger agreement is terminated signals more commitment to the agreed merger attempt. Bates and Lemmon (2003) showed that the existence of a termination fee can have a significant positive effect on the likelihood of deal completion.

To summarize, many reasons do exist why investors and authors of merger-related blogs experience uncertainty or have second thoughts concerning the outcome of an announced merger attempt. Since financial events such as a merger is being heavily discussed by financial oriented blogs (Fotak, 2008), the general hypotheses that this study aims to explore is therefore:

*Blog posts related to a failed merger attempt reflect more uncertainty compared to blog posts related to a successful merger attempt.*
3 Study Setup

3.1 Dataset Description

In the following I used of two kinds of data sources. First, I collected a sample of merger transactions of publicly-traded U.S. companies (Thomson Reuters SDC Platinum database). Second, I used a blog content aggregator (Newstex) in order to collect merger-related blog post data.

**Merger Data.** Thomson Reuters SDC Platinum (SDC) database was used in order to collect merger-related data. In this study, I focus on merger transactions that have been announced between 1.1.2008 – 31.12.2011. The sample selection took several things into account. First, I made sure that the merger transaction would be of interest to investors. Second, I ensured that these merger transactions have a high potential to get attention from blogs. Therefore, I only considered mergers with a transaction value equal or greater $100 million. In addition, I only considered mergers where the acquiring company and target company are publicly traded U.S. companies. Finally, in this study only mergers are taken into account where the deal status is either ‘completed” (successful merger attempt) or ‘withdrawn’ (unsuccessful merger attempt). Table 1 provides a description of the sampling selection process concerning merger transactions.

![Table 1: Sample description of merger data](image)

**Blog Data.** “Newstex Blogs on Demand” (Newstex) was used in order to gather blog posts that are related to mergers from the previously described sample of merger transactions. “Newstex Blogs on Demand” is a blog content aggregator and provides full-text blog content. I was able to access Newstex blog data via Lexis-Nexis, a database of legal and journalistic documents. For each of the identified mergers, the name of the acquiring company, the name of the target company, and the date range from the date of the announcement of the merger to the date of completion/withdrawal of the merger (retrieved via SDC) was used in order to identify blog posts that are related to a specific merger attempt. For each identified merger, the following Boolean search expression was used in order to ensure maximum accuracy in identifying merger-related blog posts: “company1” AND “company2” AND “merger”. The following information was retrieved from each discovered blog post: the full content of the blog post, publication date of the blog post, and the source of the blog post. Not all previously identified mergers were covered by blogs. 254 of the 318 identified mergers have been addressed by blog posts within the respective date range. Table 2 provides a description of the sampling selection process concerning merger-related blog posts.
3.2 Research Approach

In order to assess if merger-related blog posts show hypothesized characteristics, I used a computer-assisted approach for content analyses of textual data, the General Inquirer (Stone et al., 1966). The General Inquirer maps written natural language with counts on dictionary-supplied categories (182 categories in total). Several dictionaries are combined consisting of several word lists classified in categories of meaning.

Firstly, I used six word lists in order to build three pairs of word categories that are opposite in meaning. The first pair represents the concept of ‘certainty’ and is represented by words that either indicate a feeling of certainty and sureness (\textit{sure}) or a feeling of uncertainty and doubt (\textit{if}). In addition, in order to explore more deeply the described merger-related uncertainty concerning the final outcome of a merger attempt, I included other word categories. The additional concepts assess if merger-related blog posts show optimism (‘sentiment’) or the tendency towards failure (‘success’) of the merger attempt. Therefore, the second pair represents the concept of ‘sentiment’ and is represented by words that either indicate a positive (\textit{positive}) outlook or a negative one (\textit{negative}). Finally, the third pair represents the concept of ‘success’ and is represented by words that either indicate that goals have been achieved (\textit{complete}) or indicate that goals have not been achieved (\textit{fail}). A description of the word categories and their respective concept are described by Table 3.

<table>
<thead>
<tr>
<th>Concept</th>
<th>Description of word categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certainty</td>
<td>sure = words indicating a feeling of certainty and sureness</td>
</tr>
<tr>
<td></td>
<td>if = words indicating a feeling of uncertainty and doubt</td>
</tr>
<tr>
<td>Sentiment</td>
<td>positive = words indicating a positive outlook</td>
</tr>
<tr>
<td></td>
<td>negative = words indicating a negative outlook</td>
</tr>
<tr>
<td>Success</td>
<td>complete = words indicating that goals have been achieved</td>
</tr>
<tr>
<td></td>
<td>fail = words indicating that goals have not been achieved</td>
</tr>
</tbody>
</table>

Table 3: Description of concepts
Secondly, for each word pair I calculated the ‘polarity’ of each blog post in order to measure the tendency of blog posts with respect to the previously described concepts (Zhang and Skiena, 2010). In general, in this study the ‘polarity’ of a blog post with respect to a specific concept is measured as the difference between the number of words of the blog post belonging to one category and the number of words of the blog post belonging to another category, divided by the sum of the number of words of the blog post belonging to those two categories. For ‘certainty’ I calculate the ‘polarity’ as:

\[
\text{certainty} = \frac{\text{sure} - \text{if}}{\text{sure} + \text{if}}
\]  \hspace{1cm} (1)

For ‘sentiment’ I calculate the ‘polarity’ as:

\[
\text{sentiment} = \frac{\text{positive} - \text{negative}}{\text{positive} + \text{negative}}
\]  \hspace{1cm} (2)

For ‘success’ I calculate the ‘polarity’ as:

\[
\text{success} = \frac{\text{complete} - \text{fail}}{\text{complete} + \text{fail}}
\]  \hspace{1cm} (3)

4 Research Hypotheses and Empirical Results

As previously stated, in my research I explore if blog posts reflect the uncertainty concerning the success of a merger attempt during the time period between the date of announcement and the date of completion/withdrawal. Given the previously described reasons for the uncertainty of investors during a merger process, my first hypothesis (H1) that is tested is therefore:

**Hypothesis 1: Blog posts related to a failed merger attempt reflect more uncertainty compared to blog posts related to a successful merger attempt.**

For the hypotheses tests, I applied the unequal variances t-test for comparing the means of two independent samples (Weiers, 2005). I did not apply an equal variances t-test for comparing the means of two independent samples, because the corresponding F-tests on the equality of the two sample variances have been rejected in each case. In the following, with respect to the different ‘polarity’ measures (certainty, success and sentiment), for each hypothesis test, \( N \) represents the total number of blog posts related to mergers that are completed or withdrawn in the end of a merger attempt.

Statistically, H1 is explored by the following null hypotheses, which I aim to reject in the following:

\[
H_{10} \mu(\text{certainty}; \text{completed}) \leq \mu(\text{certainty}; \text{withdrawn}) \text{ vs. } H_{1a} \mu(\text{certainty}; \text{completed}) > \mu(\text{certainty}; \text{withdrawn})
\]

<table>
<thead>
<tr>
<th>Merger Status</th>
<th>Certainty</th>
<th>( N )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed</td>
<td>-0.139</td>
<td>3546</td>
</tr>
<tr>
<td>Withdrawn</td>
<td>-0.187</td>
<td>818</td>
</tr>
</tbody>
</table>

\[
t-\text{Value (F-Value)} = -2.732*** (23.829***)
\]

*** indicates 1% level of significance

Table 4: Certainty – Comparison of successful and failed merger attempts
On average, blog posts that are concerned with a merger that is later being withdrawn show a greater uncertainty (mean = -0.187; Std. dev. = 0.439) than blog posts that are concerned with merger that is completed (mean = -0.139; Std. dev. = 0.507) in the end of the merger process. This difference was significant ($t = -2.732$) at the 1% level of significance. This shows strong support for my previously stated hypothesis (H1). Furthermore, on average, all merger-related blog posts show some kind of uncertainty, which confirms that mergers are in general highly complex transactions, where many information asymmetries exist between investors and the management of the involved organizations (Louis & Sun, 2010).

After exploring the reflected uncertainty in blog posts, I explore if the merger-related blog posts reflect the notion of ‘success’ with respect to the final result of the merger attempt. Therefore, I formulate the corresponding hypothesis (H2) which I again aim to reject in the following:

Hypothesis 2: Blog posts related to a successful merger attempt reflect more success compared to blog posts related to a failed merger attempt.

Statistically, H2 is explored by the following null hypotheses, which I again aim to reject in the following:

$\text{H}_2^0 \mu(\text{success; completed}) \leq \mu(\text{success; withdrawn}) \text{ vs. } \mu(\text{success; completed}) > \mu(\text{success; withdrawn})$

<table>
<thead>
<tr>
<th>Merger Status</th>
<th>Mean</th>
<th>Std. dev.</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed</td>
<td>0.521</td>
<td>0.622</td>
<td>2969</td>
</tr>
<tr>
<td>Withdrawn</td>
<td>0.467</td>
<td>0.682</td>
<td>666</td>
</tr>
</tbody>
</table>

$t$-Value ($F$-Value) \(-1.866^*\) (13.798***)

*** indicates 1% level of significance

Table 5: Success – Comparison of successful and failed merger attempts

On average, blog posts that are concerned with a merger that is later being canceled indicate less success (mean = 0.467; Std. dev. = 0.682) than blog posts that are concerned with merger that is completed (mean = 0.521; Std. dev. = 0.622) in the end of the merger process. This difference was significant ($t = -1.866$) at the 10% level of significance, showing only slight support for my previously stated second hypothesis (H2). Nevertheless, on average, all merger-related blog posts are associated with achieving a certain goal, which indicates that blogs do not necessarily talk about the theme of failure concerning a merger attempt before the decision to cancel the deal is made.

Finally, I aim to explore if blog posts related to a successful merger attempt show more optimism before the final result of the merger is certain. Hence, I formulate the corresponding hypothesis (H3):

Hypothesis 3: Blog posts related to a successful merger attempt show a more positive sentiment compared to blog posts related to a failed merger attempt.

Statistically, H3 is explored by the following null hypotheses, which I again aim to reject in the following:
H3₀ \( \mu(\text{sentiment; completed}) \leq \mu(\text{sentiment; withdrawn}) \) vs. \\
H3₁ \( \mu(\text{sentiment; completed}) > \mu(\text{sentiment; withdrawn}) \)

<table>
<thead>
<tr>
<th>Merger Status</th>
<th>Mean</th>
<th>Std. dev.</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed</td>
<td>0.368</td>
<td>0.331</td>
<td>3706</td>
</tr>
<tr>
<td>Withdrawn</td>
<td>0.342</td>
<td>0.303</td>
<td>839</td>
</tr>
</tbody>
</table>

\( t \)-Value (\( F \)-Value) \(-2.206** \) (10.694***)

** indicates 1% level of significance

Table 6: Sentiment – Comparison of successful and failed merger attempts

On average, blog posts that are concerned with a merger that is later being canceled show a more negative sentiment (mean = 0.342; Std. dev. = 0.303) than blog posts that are concerned with merger that is completed (mean = 0.368; Std. dev. = 0.331) in the end of the merger process. This difference was significant (\( t = -1.866 \)) at the 5% level of significance, this shows support for my previously stated third hypothesis (H3). In addition, on average, all merger-related blog posts show a positive sentiment. This could be interpreted as an overall optimism with regard to merger attempts, which can be explained due to the fact that mergers are generally associated with growth opportunities, the possibility for realizing synergistic gains, and the increase of market power (Chakravorty, 2012).

5 Summary and Conclusion

In this paper I have explored if blog posts reflect the uncertainty concerning the final result of a merger attempt during the time period between the date of announcement and the date of completion/withdrawal of a merger attempt. My analysis covers mergers that have been announced between January 2008 and December 2011. The analysis is based on blog posts that occurred between the date of announcement and the date of the final result of a merger attempt.

I generally hypothesized that blog posts related to a failed merger attempt reflect more uncertainty compared to blog posts related to a successful merger attempt. With a computer-assisted approach for content analyses of textual data I created several word count measures in order to assess the notion reflected in blog posts (‘certainty’, ‘sentiment’, and ‘success’). According to my measures, I explored if blog posts related to failed merger attempts reflect more uncertainty, pessimism, and the notion of failure. My results indicate that blog posts, related to a merger attempt that is withdrawn in the end, reflect more uncertainty and less optimism, and indicate a higher notion of failure compared to blog posts related to successful merger attempts. This shows that information exchange in social media can serve as an indicator for other financial phenomena besides capital market reactions, i.e. in my case the outcome of a merger attempt. Hence, my empirical analysis fills the previously described gap in the literature and is therefore particularly suitable for triggering further empirical social media research in a financial context.
6 Limitations and Further Research

While my results provide empirical insights into merger-related blog posts, my research provides motivation for future research directions in this field. My empirical analysis is based on word count measures that I aim to refine in future research. A possible approach is to improve my described word count measures by applying additional word lists that reflect more accurately the notion of texts in a financial context (Loughran & McDonald, 2011). Furthermore, since a merger passes through several phases, it would be interesting to explore the changes of reflected uncertainty in blog posts over time.

References