

More is less or less is more?

THE MARKET EFFECT OF STRATEGIC SILENCE IN M&A
ANNOUNCEMENTS



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The market effect of strategic silence in M&A announcements

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Master thesis

Abstract:

Organizations rely heavily on investors to require the resources they need. Different tactics for influencing investors and stakeholders are used in organizational impression management. The role of strategic silence within the impression management theory is investigated within this study. The purpose of strategic silence is to influence investors or stakeholders by not disclosing all of the information available to the organization. This study examines the effect strategic silence has within M&A press announcements on cumulative abnormal returns. As an interaction effect on the relationship between strategic silence and cumulative abnormal return, this study also analyzes market overvaluation and information asymmetry. To determine the degree of informativeness for each M&A press announcement, a measurement has been developed using the results of the semi-supervised Latent Dirichlet Allocation. A multiple regression analysis is performed with the results of the LDA and the data of S&P500 companies between 2010 and 2021. There is no clear evidence found within this study that states proofs that strategic silence has an effect on cumulative abnormal return. However, strategic silence might be a good option if an organization is able to solve the problems internally and can prevent negative news from spreading.

Keywords: *Strategic silence, impression management, Cumulative abnormal returns, LDA, dictionary, market overvaluation, information asymmetry, press announcements.*

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1. Introduction

1.1 Background

Organizations are highly dependent on the approval of their investors and stakeholders in order to secure the resources they need (Meyer & Rowan, 1977; Oliver, 1991). With the approval of investors and stakeholders, organizations will be able to let their stock rise and gain capital that organizations can use to improve their company. Organizations can use a variety of tactics that will help them to obtain this support. A way to influence or gain the support of investors is through certain t of organizational impression management. Impression management can be used as a strategy through which an organization can positively influence the way the public perceives the organization (S. A. Graffin et al., 2016; Graffin et al., 2011; Rao et al., 1995). When organizations are forced to disclose negative information, they often simultaneously release positive news in order to counter the negative effects (Gamache et al., 2018). The organization wants to make sure that the investors know that the organization engages in positive activities and that there are not only negative occurrences going on within the organization. Organizations do not always disclose all of the information that they have at their disposal. Sometimes organizations deliberately choose not to announce positive news because they are afraid of the backlash that might come in the future if they cannot holdup to the standard that they are trying to set for themselves The primary focus of this research will be on organizational impression management and its impact on stock market response. It has been established that discretionary business communication has an impact on M&A and the stock market. (Gamache et al., 2018; S. D. Graffin et al., 2016). In the context of mergers and acquisitions (M&As), research has shown that the content of M&A announcements influences investors' deal evaluation (Aalbers et al., 2021).

1.2 Theoretical lens

Impression management has many different strategies that can be applied by organizations (Allen & Caillouet, 1994; Elsbach, 1994). The focus of this research will be on strategic silence and whether or not it may be used to impact the stock market. As it has been proven that providing additional information has an impact on the stock market, you could argue that doing the opposite should have an impact as well (S. A. Graffin et al., 2016; Jin et al., 2021). That strategic silence is used by organizations has already been proven in several studies (Carlos & Lewis, 2018; Leung et al., 2015; Wang et al., 2021). Research will be conducted to see whether or not the amount of information that is released influences the stock market of an organization when they deliberately do not disclose all the information available in certain M&A

announcements. It will also be interesting to examine whether purposely withholding knowledge has a beneficial or disadvantageous impact on the organization. This is interesting because it can help firms determine whether strategic silence is a good approach to have as a strategy within the context of impression management. Concluding from studies that have already been published, there is some evidence that using strategic silence might negatively influence the stock market because less information usually causes investors to be more cautious (Carlos & Lewis, 2018; Goel et al., 2021; Leung et al., 2015). Organizations may use strategic silence as a strategy because they would rather face a minor loss now than a greater loss later. (Carlos & Lewis, 2018). It is also possible that companies omit information because they are afraid that it will have a greater negative impact on their stock market if the information is released than withholding the information on purpose. The organization may attempt to resolve the issue internally, avoiding the need to reveal the issue to the public. This research will also look into whether market overvaluation, which can be seen as a sign of trust, and information asymmetry can minimize or enhance this effect.

1.3 Research gap

Ample research has investigated the influence of specific deal characteristics on investors' reactions (Campbell et al., 2016; Schijven & Hitt, 2012). For instance whether an acquisition is more explorative or exploitative has a big impact on the way in which investors react (Aalbers et al., 2021). There has been a huge amount of research on how to use supplementary material close to an M&A announcement to disrupt certain effects and divert attention away from bad news. (S. D. Graffin et al., 2016; Jin et al., 2021). Especially information that is released next to the acquisition announcement can shift the perception of the investors from a negative point of view to a positive point of view (Gamache et al., 2018; S. A. Graffin et al., 2016). However, research has overlooked how strategic silence in firm disclosures influences the market. Even though it is overlooked it can still be of importance. Strategic silence is applied in many different fields of study (Carlos & Lewis, 2018; Donovan & Boyd, 2021; Le et al., 2019; Raimundo, 2015). Strategic silence in organizations can have a big influence on organizations and is a fairly new and thinly researched concept within the context of organizations (Carlos & Lewis, 2018; Leung et al., 2015). Furthermore, strategic silence can be of practical use to the board of an organization in deciding what they should and should not include in their M&A press announcements. Lastly, strategic silence can add to the literature of impression management in getting a better understanding of the effect that information, or in this case a lack of information, has on investors.

Strategic silence is deliberately omitting certain deal characteristics. A company does not disclose certain information because it is afraid of the effects of this information and that it might damage the organization now or in the future. Strategic silence can be seen as a part of the impression management theory (Carlos & Lewis, 2018). There have been studies researching strategic silence in different contexts but not in the context of stock markets before (Carlos & Lewis, 2018; Donovan & Boyd, 2021; Le et al., 2019; Raimundo, 2015; Wang et al., 2021). That strategic silence is used as a strategy by organizations as can be seen by previous studies (Carlos & Lewis, 2018; Leung et al., 2015; Wang et al., 2021). The reasons for using strategic silence differs depending on the circumstance and situation. In the organizational context, the circumstances of an M&A announcement have not been widely examined, nor has it been determined whether or not strategic silence is actively used as a strategy within this field. This research will contribute to the impression management literature in the topic of strategic silence, allowing for a deeper understanding of the idea. The idea of strategic silence as a part of the impression management is only researched by Carlos and Lewis (2018). While it could be a valuable addition to the already existing literature and understanding of impression management. It will address the effect that strategic silence has on the stock market response, which can be of help for organizations to better understand the impact of their announcement. Hence, the following research question.

How does strategic silence influence the short-term stock market response to acquisition announcements?

This study intends to address this gap by studying the data of a large amount of organizations. This research will be using the database of S&P 500 companies and M&A press announcements of these companies. S&P 500 is an American stock market index that keeps track of publicly traded domestic companies. This index is a good measurement to take when researching the performance of the American stock market. The M&A press announcements are collected from publicly made announcements by organization. In these announcements research will be conducted to find the amount of topics which are excluded to see what the degree of information is within these press announcements. If an organization discloses very little information in its press announcements it will probably be done deliberately because an organization will have access to the information but has chosen not to disclose this information. An investor will consciously or sub-consciously notice that there is less information disclosed in a press announcement. Consciously or sub-consciously influencing investors is part of the impression management theory. The goal of this study is to achieve a deeper understanding of

the effect of strategic silence through impression management on short-term cumulative abnormal returns. Managerial research on investor responses to acquisition announcement has shown that prior acquirer evaluation, like overvaluation, has an influence on the way in which investors react to press announcements and the stock market (Fama & French, 1995; Hansson & Åvall, 2017; Tsai, 2017). Overvaluation can be a sign of trust in the organization (Tsai, 2017). If there is more trust in the board of an organization, investors might attach less value to information and this can have an influence on the relation between strategic silence and stock market response (Hansson & Åvall, 2017). Research has also shown that the information asymmetry between investors and the organization influences the stock market and the way in which they react to acquisition announcements (Goel et al., 2021; Hassan & Alhenawi, 2022). The information that they receive might be valued more, If there is already less information available or the investors know there is a lot of information asymmetry. This would result in the fact that when information is left out this will have an even bigger effect on the stock market response. Therefore this study will take both of these relationships into account and see if they have an influence on the relationship between strategic silence and the stock market.

1.4 Contributions

This research will contribute to a few things. First of all this research will contribute to the M&A literature. It will expand on the acquisition literature by adding a new dimension that have not yet been researched before (Gamache et al., 2015; S. A. Graffin et al., 2016; Haleblan et al., 2009; Schijven & Hitt, 2012). This new dimension can be seen in the lack of information that is deliberately shared with the investors. There has been a lot of research on the way that information is brought to investors and when this information is disclosed, but there has been almost no research done on deliberately hiding information from the investors and the influence of the amount of information disclosed (Leung et al., 2015; Wang et al., 2021). Practically, this is relevant for organizations because they can see whether or not it is a good strategy to use in certain situations and what the effect is of addressing more or less topics in M&A press announcements. This research will also further expand on the use of strategic silence as a part of the organizational impression management within organizations. The concept of strategic silence is fairly new within organizational context (Carlos & Lewis, 2018; Donovan & Boyd, 2021; Le et al., 2019; Leung et al., 2015). Seeing strategic silence as a part of the impression management theory and treating strategic silence through the scope of this theory has only been done by Carlos and Lewis (2018). The combination of these two theories can be theoretically relevant because it studies the other side of the impression

management. The other side being the reaction to not disclosing information at all instead of disclosing extra information or changing the way in which information is delivered. This will be a valuable addition to the impression management theory as it expands on the way in which this strategy can be used in organizational context with a focus on M&A. The combination of these two theories is also one that makes sense as strategic silence also tries to influence the outcome of situations by altering information. The effect of information on people is also the main focus of impression management.

Lastly, this study will contribute with the use of methods as well, as it will combine Latent Dirichlet Allocation with a self-constructed dictionary. This dictionary will be created through studying a randomly selected sample of press announcements and taking out the keywords for topics. Normally, Latent Dirichlet Allocation is an unsupervised method that works on its own, but this study will guide it through a dictionary of words (Blei et al., 2003; Gamache et al., 2015; Gioia et al., 2013). The words in this dictionary will be linked to certain topics that this research can then test for in the press announcements through Laten Dirichlet Allocation. The result of the LDA will be used for a regression analysis. The combining of these two methods has not yet been done before within the context of strategic silence and M&A, and might help guide topic modeling which could be useful for future research.

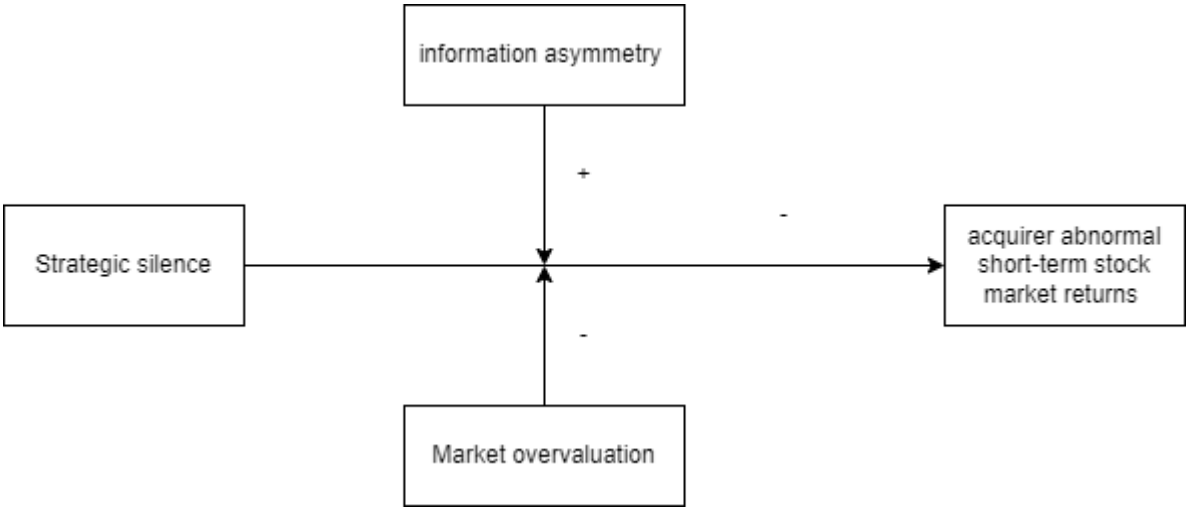


Figure 1. conceptual model

2. Theoretical Framework

2.1 Strategic silence and impression management

This study draws on the impression management theory because this theory deals with the way in which organizations or people try to influence certain situation or try to prepare people or organizations for certain outcomes (Elsbach, 1994; Elsbach et al., 1998; S. A. Graffin et al., 2016; Jin et al., 2021; Rao et al., 1995). The impression management theory is used in different kind of fields for research and has many applications (Brandon-Lai et al., 2016; Elsbach et al., 1998; Farrow et al., 2015; Sandberg & Holmlund, 2015; Yan & Ho, 2017). Impression management was first researched in psychology (Barocas & Christen.D, 1968; Braginsky & Grosse, 1966; Mintz, 1963). In psychology it was mainly used as a way to shape the expectations of people or to manipulate people in a way that was beneficial to the one using this strategy. It was primarily about how you come across, and what you can do to naturally alter the expectations of the other person (Bennett & Livingston, 2018).

However, this research shall focus on the organizational impression management theory, and within this theory this study shall zoom in further on strategic silence, the M&A side of the impression management theory and the effect it has on the investors. Because my study will primarily focus on how firms provide information to investors in M&A press announcements, the impression management theory is a good fit for my research question. Organizational impression management can be applied in a variety of ways. Employees can use organizational impression management to control their supervisors' expectations, and managers can use it to generate particular expectations among their employees or stakeholders (Elsbach et al., 1998; Rao et al., 1995). The goal of organizational impression management is to persuade people who have an impact on the organization to take a specific action. (Carlos & Lewis, 2018; Gamache et al., 2018; Jin et al., 2021).

Within organizational impression management there are different strategies. In order to paint a more clear picture of the organizational impression management theory this study shall discuss some of the more commonly used strategies within this strategy.

The traditional strategies of organizational impression management are ways to deliver information towards people in a certain form, for instance: an excuse, a justification, ingratiation, intimidation, apology, denouncement, or factual distortion(Allen & Caillouet, 1994). All these strategies are about the way in which you formulate your sentences and the

underlying message you are trying to get across. For example, an excuse is a way of not taking full responsibility and claiming that it is not entirely your fault..

Big bath is a strategy that is used mostly by new CEOs who wish to clean the slate when they are appointed, or by a CEO who wants to make a bad performing year look even worse. They do this by making past results appear worse than they actually are, and to blame the previous CEO for the poor results so that it does not reflect poorly on them (Goncalves et al., 2019; Hope & Wang, 2018; Pierk, 2021). Another argument to do this is because future results will appear to be better since they will be compared to the previous year's figures, making it appear as if the organization's earnings are substantially improved. The organization might adjust the impression investors have of the business or of the new CEO by making themselves look better at the cost of the old management team of the organization or at the cost of the results of the previous year. This may lead investors to believe that the company's performance and strategy is improving. The fact that big bath is all about changing the way in which investors perceive an organization makes big bath a strategy that can be linked to the impression management.

Impression offsetting can be linked to impression management because it manages the impression of a company. It does not attempt to conceal the negative announcement with something more positive, but instead makes a separate announcement alongside the negative announcement. It mitigates the negative impact of a bad-news announcement by simultaneously publishing a positive announcement that is unrelated to the bad-news announcement. It basically tries to balance the scale. This is often used by organizational leaders to mitigate negative focal events (George et al., 2016; S. A. Graffin et al., 2016). This is a reactive strategy used by organizational leaders, but for external stakeholders these focal events will happen simultaneously. This is a very effective way to manage stock markets and investors reaction, as it can reduce the negative impact on stock markets with more than 40% (Haleblian et al., 2009). So it is very important for organizational leaders to know what the impact is of an announcement on the stock market in order to mitigate damages (Haleblian et al., 2009).

Organizations can also use *strategic noise* as an impression management strategy (Graffin et al., 2011; Jin et al., 2021). Strategic noise is an announcement that is released during the time of a decision announcement, like for instance the selling of shares. These announcement are not related to the decision announcement but do have an effect. This is also a form of reactive impression management, and has some overlap with impression offsetting. Strategic noise however does not only counter a negative announcement by creating a positive announcement.

If an acquisition is positive, a firm may release negative information that has to get out there anyway. If the expected outcome of a decision announcement is really negative it might drop even more negative information, because the situation is lost anyway (Jin et al., 2021). Strategic noise is often used as a strategy to assess whether it is a good idea to release certain information that has to get out there anyway or to release some noise that might counter a negative event.

Silence within an organization is defined by Woon and Pang (2017) as followed: “a lack of communication from an organization or its failure to provide clear and adequate responses to questions or concerns raised.” (Woon & Pang, 2017, p. 335). This has the option of either being intentionally or unintentionally. It is important to separate intentional silence and unintentional silence for this research. Unintentional silence can be defined as the situation in which an organization has no other choice than to remain silent. Decisions, in this case, are not made by the organization but are made for the organization because of internal or external factors that are out of the organizations control, while the organizations might not even be aware of this. Unintentional silence is also classified as “natural silence” (Le et al., 2019; Woon & Pang, 2017). Intentional silence, is deliberately omitting certain details or not disclosing certain information, this can be defined as *strategic silence* (Le et al., 2019). Research has shown that organizations sometimes use strategic silence to manage crises, and that this can be effective (Le et al., 2019; Woon & Pang, 2017). Where silence is often seen as weak response in crises, it can be effective. It is possible that it creates trust. If an organization has to deal with a crises, it can communicate to the outside world that they are trying to figure it out and will provide information as soon as they have a grasp on the situation. Le et al. (2019) states that there are three different types of strategic silence, namely: avoiding silence, hiding silence and delaying silence. Avoiding silence is about staying quiet in order to avoid having to cave in to certain demands. So by not addressing certain demands and trying to avoid them they hope that it will pass by. Hiding silence is the withholding of certain information from stakeholders indefinitely. Delaying silence is about not yet disclosing all the information that the organization has, they will disclose this information as soon as they have the full picture. The first silence is not really relevant for us since there are no demands being made or answered in the press releases that will be researched. The last two silences however will be relevant because in the press releases organizations might not address all the information and they may disclose this information later on or they might not disclose this information at all.

Strategic silence is not only used as a strategy for organizations. Politicians and the press, for instance, also use this strategy (Donovan & Boyd, 2021; Raimundo, 2015). For politicians it

might sometimes be better to not respond and wait for something to cool down instead of giving an immediate reaction. Newspapers can have a big impact on society by explicitly choosing not to cover certain stories or by choosing to highlight a certain event only one-sided. This research will only dive into strategic silence, however on an organizational level and the effect it has with regards to M&A press announcements.

In this study, the focus will be on strategic silence as a part of the impression management within the context of M&A press announcement. Strategic silence can be seen as a part of impression management because it tries to manage the way people react, behave or interpret certain information, or even better how they react, behave or interpret something because of a lack of information (Carlos & Lewis, 2018; Leung et al., 2015). Through strategic silence, companies might be able to manipulate the stock market by omitting information. Research has already been conducted on the reason why certain companies omit information. Prior research has shown that sometimes companies omit information, even when this information is about positive characteristics of the organization. Hotels for instance can earn certain certificates that show that they run their business in a sustainable matter, but they do not advocate this in public. Even though this may be of positive influence they are afraid of backlash when they violate these certifications and therefore take a little loss right now in order to prevent a possible big hit later on (Carlos & Lewis, 2018). However, there has been almost no research on strategic silence within mergers and acquisitions (Carlos & Lewis, 2018). This research wants to see from both a theoretical and practical point of view, if strategic silence can be used as a strategy for impression management when it comes to influencing the stock market during M&A. The reason to choose strategic silence is not just because of the lack of research but also because it is different from strategic noise, impression offsetting and other strategies within impression management. Instead of reacting to investors reactions, it tries to prevent negative reactions by not addressing certain issues in a press release that other companies would address during M&A press announcements. By using strategic silence, companies can manage impressions of their investors with regards to the stock market, before release of the press announcement even happens. They are able to perform an acquisition or merger hopefully more smoothly by not disclosing all the information available. This is the reason why this research will be of practical use as well.

In this study it will be researched if the reaction to omitting certain information is moderated via the variables: market overvaluation and information asymmetry. Earlier research already suggest that these interactions have an influence on the value that investors attach to a M&A

announcement (Guo et al., 2020; Schijven & Hitt, 2012). Market overvaluation can be seen as a sign of trust.(Guo et al., 2020; Tsai, 2017). Information asymmetry will also be taken into account, because it has been proven that the less investors know about an organization the more they are dependent on the information that they will get from the company itself, which is why this research also needs to take this interaction effect into account (Schijven & Hitt, 2012).

This research thinks that the effect of strategic silence will have a negative effect on the stock market returns. There are believed to be a few reasons for this expectation. Research has shown that a lack of information causes for a decrease in stock market value because investors perceive a lack of information as an increase in risk and are therefore not willing to pay as much (Goel et al., 2021; Hassan & Alhenawi, 2022; Schijven & Hitt, 2012). Investors want certainty in order to know what they are investing in. Secondly, this study thinks that strategic silence has a negative effect because the opposite has been proven to have a positive effect, namely the use of extra positive information to counter negative information. This is proven by the strategies that were described before. Also, the fact that information must be kept hidden could indicate that it is negative; the fact that information has not been disclosed could indicate to investors that it would not be positive if disclosed, and thus stock market returns will be lower for companies that use strategic silence on this topic than for companies that do disclose these features. However, as described in the article of Carlos and Lewis (2018), companies sometimes rather take a smaller negative hit now than a bigger negative hit in the future. Prior research shows that companies who hide information generally already have a poor performance and could be in financial distress, so a lack of information can be a sign to the investors that this is the situation of the organization (Hassan & Alhenawi, 2022; Leung et al., 2015; Schijven & Hitt, 2012). The strategy of not giving out all the information can also be used to lower the expectations, so that in the future they will not let the investors down (Carlos & Lewis, 2018; Wang et al., 2021).

Strategic silence generally is used to omit information that reflects negative on a situation, the organization or the person. By not disclosing this information they can create a more positive outcome than they would have if they gave full disclosure on a certain situation or topic. However, by not releasing all of the facts, they will have a greater negative outcome than an organization that has no negative news on this topic and can present positive news (Donovan & Boyd, 2021; Le et al., 2019; Leung et al., 2015). It is also rather risky to not disclose information if there is a chance that investors will find out later. This can create a certain mistrust, which can be hard to get rid of (Maor et al., 2013). Strategic silence will only be

positive if investors do not find out about the event or information that the organization is not disclosing to them. Strategic silence might however be a good option if the company states that it will disclose the information at a later point in time when they can be more specific, this way the investors know that they are not left in the dark and will be informed later (Le et al., 2019). A good strategy for an organization might also be to engage in strategic silence if they are willing to and can fix the problem internally (Maor et al., 2013). By fixing the problem internally, they can prevent the negative news from ever having to be disclosed in the first place. If it is a problem that the investors already know about, they could also state that they are working on the problem instead of disclosing negative news (Maor et al., 2013). If an organization only states that it is working on the problem and discloses the news once the problem is solved it also prevents sending out mixed signals.

So strategic silence can be a good strategy for an organization if they can fix the internal problem and do not have to address it to investors. However, through not disclosing all information there is a big chance that the stock market will react more negatively on their announcement than on the announcement of an organization that discloses all the information. Strategic silence can be seen as a damage control strategy.

That is why the main hypothesis will be formulated as followed:

Hypothesis 1: The use of strategic silence during an M&A press announcement will negatively affect the stock market returns of this M&A.

2.2 Relationships

Two relationships will be tested with regards to the main hypothesis.

2.2.1 market overvaluation

The first relationship this study tests is market overvaluation. Overvaluation can be a sign of trust that the investors have in a company. If overvaluation occurs, this means that the investors value the company more than the book value of that company. If there is an overvaluation, this study states that the investors have trust in the course that the board of the organization is following. Investors are willing to pay more than the estimated value of the net assets of the company. Overvaluation can be caused by emotional or gut driven decisions, this can all be caused by the trust that the organizational leaders managed to create. This study measures market overvaluation through book-to-market ratio (Guo et al., 2020). A high book-to-market ratio can be seen as a sign of higher perceived risks by investors (Auret & Sinclair, 2006; Fama & French, 1995; Goel et al., 2021). So if a high book-to-market ratio can be caused by perceived

risk, a low book-to-market ratio can be caused by trust. If there is trust then investors might attach less value to the information that is disclosed to the public through press announcements, because they believe that the organization is on track (Tsai, 2017). If there is an increase in trust, investors will perceive less risks and uncertainty (Hansson & Åvall, 2017). It could also be that organization, who are overvalued and enjoy trust from their investors, might be less willing to engage in strategic silence because they might fear that they damage this trust if investors hear that they do not disclose all the information to the investors. The influence of market overvaluation on the relation between strategic silence and stock market response will be interesting because market overvaluation might lower the negative effect of strategic silence on the stock market response. However, organizations might be less willing to engage in strategic silence. Another situation that could occur is that the organization simply does not feel the need to mention a certain topic as it knows it has a strong reputation within that area and that commenting is not necessary or would only be cause for investors to ask questions. which they do not want (Maor et al., 2013). The hypothesis will be about the influence of market overvaluation on the stock market response when the organization does engage in strategic silence. So strategic silence will be less influential when there is more trust.

Therefore the second hypothesis is formulated as followed:

Hypothesis 2: The negative relationship between strategic silence and the effect that strategic silence has on the stock market returns is weakened if the stock market of the organization is overvalued.

2.5.2 Information asymmetry

Information asymmetry is the other relationship that will tested with regard to the main hypothesis. In this case information asymmetry is about the difference in access to certain information between the investors and the targeted company. Organizations usually have all the information with regards to their own company, but the investors or acquiring parties might not be getting the whole picture. The more information the organization discloses to their investors or acquiring party, the better they understand the value of this organization. So the more information is publicly known, the better the targeted company can be valued and the less risk is involved. This is the reason that if people know a lot about a company they usually will value this company higher than companies that disclose little information (Goel et al., 2021). This study identifies the amount of information that a company discloses through the characteristics of that company, namely whether or not it is a public company or a private company (Brent &

Addo, 2012; Haleblan et al., 2009). Public companies need to disclose more information by law than the often smaller sized private companies need to do. Public disclosures by public companies can minimize the risk of information asymmetry from the beginning, which in return will increase the price of stock as more investors feel secure about the information they receive (Diamond & Verrecchia, 1991). This makes researching public companies much easier than private companies. It is proven that the characteristics of a company, and whether it is private or public influences, the way in which the stock market reacts to a merger or acquisition. In the research of Chiang (2005) it is stated that “a company that signaled more information to outsiders will eliminate information asymmetry.” (Chiang, 2005, p. 12). A public organization will have to disclose more information to its investors and the outside world to attract new investors and to keep their investors satisfied. To keep up with regulatory demands, it can be said that information asymmetry will be lower for these organizations in comparison to private organizations. In private firms, the only one that can confirm the information is the one that discloses the information so there will naturally be more information asymmetry between the company and the outside world. Private firms do not need other people to confirm information as this is not regulatory obligation (Stein, 2002).

So if a company is public, this means that it has to disclose more information to begin with and this means that if a certain topic is omitted this will be a relative smaller portion of information that has been omitted compared to a private company of which investors know a lot less. If a public company acquires a private company the investors might need to make more effort in order to be as well-informed about the private company as they would be when taking over a public company.

This research therefore formulates the following hypothesis:

Hypothesis 3: The negative relationship between strategic silence and the effect that strategic silence has on the stock market returns is weakened if there is less information asymmetry between the organization and its investors.

3. Methodology and data

The methodology and data section explains which methodological techniques are used and why these techniques are the best choice for this study. This section will first of all explain which empirical context is used in this research. It will then show you where the data is

collected and which data shall be used for this research. Thirdly, the variables shall be presented and the way in which these variables are measured. Lastly, the analytical method shall be described, which explains the strategy for the testing of the hypothesis.

3.1 Empirical context

The empirical context of this study is the effect that omitting information in M&A announcements has on the stock market response. Omitting information is done in many different fields of work. It happens in the press, in politics and within organizations (Donovan & Boyd, 2021; Le et al., 2019; Raimundo, 2015; Wang et al., 2021). Leaving out information always affects the way a message is perceived because the more you know the better the picture is that you can form of a certain situation. This can be used by organizations. Hence it is relevant to research this concept in the context of M&A announcement because the outcome can be useful to both investors and organizations. There will always be certain topics that organizations are obligated to report because of certain laws or regulations, but there will also be room to leave out certain things or to elaborate more on topics.

The most direct way to measure the impact of strategic silence within the M&A announcement is by seeing if there is a change in the stock market response. Investors will always react to information with regards to the stock market that they are involved in (Aalbers et al., 2021; Woolridge & Snow, 1990; Zhang et al., 2016). If something appears to be steering an organization into a poor position, the business's stock will drop since it becomes less appealing to invest in this company. If the scenario is favorable, it will be more appealing to hold or purchase this stock, and the price will rise. Prior studies have found that there is a stock market reaction following an acquisition announcement (Oswal & Goel, 2020; Pandey & Kumari, 2020). The stock market reaction will be measured over a short period of time within this study. By measuring the reaction of the stock market over a short period of time you minimize the noise that interferes with the event that you want to investigate

3.2 Data

This research addresses the gap that is found by applying both an unsupervised and semi-supervised machine-learning method, (hierarchical respectively keyword-assisted) latent Dirichlet allocation (LDA). Out of 3,500 M&A press announcements by S&P500 companies between 2010 and 2021 a sample is chosen with observations that are useful for this study (Eshima et al., 2020; Teh et al., 2006). Semi-supervised means that a dictionary of words will be created that will indicate certain topics that are usually addressed in press releases (Gamache

et al., 2015; Gioia et al., 2013). Furthermore this study performs LDA on the sample of M&A press announcements to identify which of the chosen topics are addressed within the press announcements. It will then be made visible which organizations leave out topics within their announcements and have a stock market response that deviates from a normal stock market response to an M&A announcement. An unsupervised LDA is also performed in order to see which topics the algorithm recognizes on its own, I can compare these topics with the unsupervised topics. This way the main advantage from LDA, which is an unbiased way of defining topics, can still be taken into account. The topics from the unsupervised LDA can be compared to the specifically targeted topics that were constructed in this study's dictionary. This is done to see if there are topics missing or if the unsupervised LDA uses topics that could also be of use to this research. The unsupervised LDA helps to improve the validity and reliability of this study.

LDA is the best way to test strategic silence because it can give a clear overview of which topics are addressed in each of the different press announcements. LDA has been used by other research before to identify the main topics of texts, and this is also the main purpose of LDA (Bi et al., 2019; Guo et al., 2017; Nejad et al., 2020). If it is clear which topics are addressed in which press announcements it is also clear which topics are left out. The board should possess a lot more knowledge than the average investor about the organization. Leaving out certain topics in a M&A press announcement shall therefore be assumed to be deliberate and with the intention to influence investors. This research will assume this because the board should have all the information at their disposal and can therefore make the choice for each topic to share it or not.

Semi-supervised LDA is a combination between qualitative and quantitative studies and combines the selective process of qualitative research with the clear overview of quantitative research. It will be qualitative as this research will scan 80 press announcements and code all keywords within these announcements to combine them into topics with the help of ATLAS.ti (Fugard & Potts, 2015). This research will then perform a quantitative process to see if these topics reoccur in all the press announcements. The outcome is used to follow up and see if the stock market is influenced.

S&P500 companies are companies that are all publicly traded companies in the United States. S&P500 is a stock market index. This stock market is a well-known and respected stock market index. The S&P500 has been well researched in prior studies (Baran et al., 2018; Martin et al., 2016; Yilmazkuday). Within this dataset we can find information about M&A deals of different

types. This study only uses the observations concerning a target company that is either public or private as this is what we want to know for our interaction effect. The data from subsidiary companies in this dataset and in press announcement could interfere with the results as it might differ from the observations of a public or private company. If subsidiary companies have unique characteristics within M&A deals or within their press announcement and these observations are used in our analysis this could interfere with the results. The data from these companies can be used to calculate a number of results. This study uses this database to research the organizations that withhold topics within their press announcements and see what the cumulative abnormal return (CAR) is after the press announcement in comparison to the price of the stocks of that company before the announcement. CARs is a tested way to measure the impact of an announcement or event on the stock market, and can show how investors respond to the announcement (Haleblian et al., 2009; Kaplan & Weisbach, 1992; Woolridge & Snow, 1990). This database is also used to calculate the book-to-market ratio that will be used in order to measure if an organization is overvalued and to see if a target company is public or private which relates to my moderators.

3.3 Variables and measurements

3.3.1 Dependent variables

Acquirer abnormal short-term stock market returns. In order to see if strategic silence has an effect on the stock market it is necessary to find a way to measure stock market changes. A way to do this, which has been used in the past by other researchers, is by measuring short-term CARs (Haleblian et al., 2009; Kaplan & Weisbach, 1992; Woolridge & Snow, 1990). Abnormal returns are about an unusual large profit or loss that is generated by an investment of portfolio over a certain time period. CARs are the difference between the returns that the investors of a company earn on the assets of the company and that of the expected returns on stock. The difference will mainly be caused by the announcement that is made and will be influenced as minimal by other factors that can be of influence if you take a longer period (Haleblian et al., 2009; Lee & Connolly, 2010). Therefore, this study uses CARs to do an event study because this can show what the effect of the event this study wants to research (in this case the press announcement) is on the stock market.

An event study was chosen for this research as the effect of an announcement on the stock market has to be measured without interference of other effects. There can be a lot of noise and other factors that influence the stock market. By doing an event study with short term CARs as much noise as possible will be filtered out so that the effect of the press announcement can be

captured as accurate as possible. With the data of the S&P500, the CARs for these companies can be calculated. For the rate of return of stock an estimation window of (-300,-50) will be used between 300 and 50 days prior to the announcement. This window is used because it can establish what the rate of return is before the announcement is made. The return of stock is calculated as followed:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}.$$

In this case R_{it} is the return of stock on stock i for date t ; R_{mt} is the return on S&P 500 index for date t , and α_i and β_i are the ordinary least squares estimated for the stock i 's market model parameters (Yi et al., 2021). The ordinary least squares estimates are measured over a period of 300 to 50 days prior to the press announcement. The abnormal return shall be measured as followed:

$$AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt})$$

For the abnormal return this study wants to see the effect of the press announcement in a short period of time so this research will take a difference of 3 days before and after the announcement (-1,1) (Foerderer & Schuetz, 2022). The cumulative abnormal return can be calculated in order to see the effect of the M&A announcement on the CAR. This is calculated using the following formula:

$$CAR_i = \sum_{t=T_1}^{T_2} AR_{i,t}$$

The outcome should show whether or not there is a difference in CAR between M&A's with more or less topics that are addressed in the M&A announcements. The CAR is defined for each announcement that discloses less or more information than other announcements. This should show whether there is an abnormal return that deviates from the other M&A announcement and if it differentiates from the normal rate of return on stock. This way, it can be ascertained whether or not omitting issues has an effect on the stock market, what degree of information has what effect, and whether or not this effect differs from the other press announcements with varying levels of information. The SDC number, which is unique to each organization, can be used to match press announcements with their respective CARs.

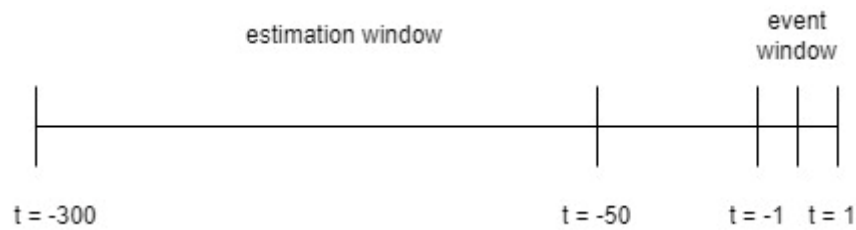


Figure 2. time window CARs

3.3.2 Independent Variables

Strategic silence: semi-supervised approach. Firstly, this research defines topics based on the dictionary that will be created. This study looks for keywords in the text of the press announcements to see which words link to which topics. The topics are deduced from literature and the press announcements that are researched. This study wants to make sure that a topic is addressed more than once, if it is addressed in a press announcement. If it is addressed only once there is a big chance that it might be a topic that is just related to that one organization and not of importance for this research. By looking at text and using codes to relate words to topics, this study can combine qualitative and quantitative research. Keywords are linked to a topic and if there is overlap this research will try to combine these topics. The forming of a dictionary has been done in other research before as a way to define certain topics, which is what this study aims to achieve as well (Gamache et al., 2015). This research looks for these keywords to form a dictionary in a random sample of 80 M&A announcements from the data. In order to appoint keywords to topics the program ATLAS.ti is used. ATLAS.ti is a software program that helps with the analysis of text, and hence can help with coding the press announcements. Through coding, a dictionary is created by assigning keywords to topics. Next to deducing topics from the random sample of press announcements, literature is also taken into account to see if there are certain topics that are of importance for M&A announcements.

The reason this study performs a semi-supervised approach is because this way this study can control for the topics that it wants to research and the topics can be based on literature. This is an advantage because it gives this research a guideline and a controlled environment in which it can clearly show some topics coming back or being omitted. By choosing topics, this study can also make sure that these topics remain relevant and will more likely have an impact on the CARs. An unsupervised LDA is also performed in order to see if this LDA got the same topics or whether or not the semi-supervised LDA missed some topics. The advantage of a normal LDA is that it defines its own topics and is completely unbiased. It takes words in the text that it recognizes and from which it knows that they are related to other words and makes topics this

way. It might discover topics that were not discovered beforehand or it might combine topics of which there was no clear relation at first. A graphical model of LDA can be found in figure 3. This research inspects whether these topics should be combined in this research or if it is better to keep them separate. The unsupervised LDA will serve as a sort of control run to see if the topics were chosen right or if this study missed certain topics or keywords, this helps increase the validity of this study. LDA is a good way to measure strategic silence as it can define which topics are in a press announcement and therefore which topics are not in a press announcement. LDA has been put forward as a good way to define topics and to see the effect of information on CARs (Feuerriegel et al., 2016; Ranco et al., 2015).

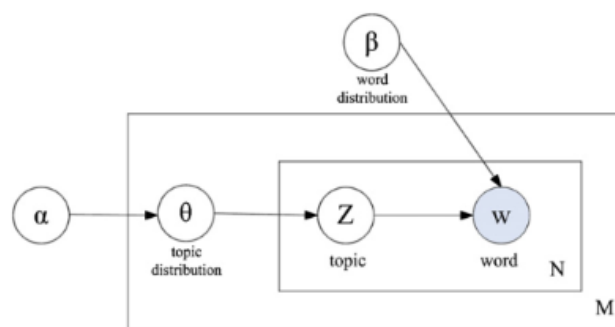


Figure 3. Graphical model representing LDA (Cao et al., 2009).

There are a few assumptions made with LDA. Each press article will be seen as a bundle of separate words, so the order of the words or the function of the words will not be taken into account. It does not matter if a word is a verb, subject, object and so on. Words that do not carry information will be eliminated so they have no influence on the LDA. Words that have no influence are for instance words like are/of/a/the/is, words that occur often in almost all documents will be eliminated as they have no influence on this research.

In order to perform LDA this research takes some steps for data pre-processing. Namely tokenization, transforming words and removing punctuation, stemming and eliminating words (Feuerriegel et al., 2016). This research does this in the following order and procedure:

LDA starts with cleaning the data, there are certain words that need to be removed in order to get better results. This is information that needs to be removed, because it will not give any information towards this research, and will be typical for the announcement documents that are in the database.

As described before, the textual data also needs to be preprocessed. The order in which the preprocessing happens is also of importance (Denny & Spirling, 2018; Maier et al., 2018). The

first phase will be tokenization, which entails dividing the documents into units, which will be words. Following this phase, capital letters must be transformed and converted to lowercase letters. After all of the words have been converted to lowercase, all punctuation and special characters are deleted from the text. All of the stop-words are removed after this is done. Stop-words, like prepositions, are often functional terms. Stop-words should be removed because they appear in virtually all press releases and provide no further information. The following step is stemming. Stemming causes words to be reformed to their root form so that plural words are transformed to the same root as words indicating one subject or object (Manning et al., 2010). After this is done, the last step involves relative pruning. There will be a lot of words which barely ever occur or will not be seen in many different press announcements, and therefore these can be removed. On estimate half of the words will occur only once (zipf's law)(Manning et al., 2010). Words that are not relevant to this study are removed with the help of pruning, this way the number of words studied will be reduced. (this will help the performance of the algorithm) (Maier et al., 2018). This research removed all words that appear in more than 99% of the documents or appear less than 5 times in the documents (Denny & Spirling, 2018; Grimmer, 2010; Grimmer & Stewart, 2013; Maier et al., 2018). Excluding a bigger percentage might interfere with this research, as the main focus is to only investigate the effect of topics deliberately left out on the stock market.

After this is done, model selection takes place. In model selection you determine the parameters of your model, this includes the number of topics (K), and the prior parameters, which are addressed as α and β (Maier et al., 2018). The α can control the mixture of topics within all the documents. If you lower the α the mixture of topics within documents will be less. The β is about the distribution of words for every topic. If you lower the β there will be less words that make up a topic. Through this process it is possible to find the best possible model that fits the data from the press announcements that were found. The model should make sure that interpretability is good and this should be the prime concern. However if it cannot be reproduced it is useless, so interpretability and reliability are connected and related to the model's validity and are considered as well (Maier et al., 2018).

For choosing the number of topics, this research shall use the model of Cao et al. (2009) and Deveaud et al. (2014). They both developed models that can be used to define the number of topics that should be set before conducting an LDA. It is crucial for topic modeling to find the right amount of topics in order to have a good performing LDA. The model of Cao et al. (2009) uses the density of the document to adaptively select the best LDA model. It states that the LDA

model performs at its best when the cosine distance of topics reaches a minimum (Cao et al., 2009). A lot of models follow the same basic principles when it comes to selecting the amount of topics for the LDA model, namely computing similarities between different pairs of topics. In his research, Deveaud et al. (2014) said: “The optimal amount of topics of a given collection is reached when the overall dissimilarity between topics achieves its maximum value.” (p.67). Both these models that will be used to get the amount of topics for the unsupervised LDA can be put into R.

For the semi-supervised LDA, this study predetermines the amount of topics and the keywords associated with these topics. This way there is no need to conduct several LDAs to find the best amount of topics that best fit with the press announcements. In this case this research can insert these topics into the LDA and the LDA will search for these topics. This study takes a random sample of press announcements in this study in order to analyse them for keywords. There has been a lot of debate on what a good sample size is (Sim et al., 2018). There are a few ways in which random samples are collected in qualitative research. The three most broad strategies are: convenience sampling, judgement sampling and theoretical sampling (Marshall, 2013; Marshall, 1996). Convenience sampling is mainly about taking a sample that fits the budget and time you have. Judgement sampling is about selecting the samples that are working best for the research that needs to be conducted. Theoretical sampling is about creating interpretative theories out of the data that comes forth and it will then select a new sample of data to build further on this theory (Marshall, 1996). In this case however this study already has a lot of data at its disposal so these methods will not really be applicable to this research.

In the research from Viechtbauer et al. (2015) and Galvin (2015) there has been a model developed to calculate the sample size for qualitative studies, which could be of use to this study:

$$n = \frac{\ln(1 - \gamma)}{\ln(1 - \pi)}$$

Here the n is about the number of documents that this study would want to sample. The π stands for the chance that the a topic occurs in the document. γ is about the percentage this study wants to be sure that the topic is included in the document. This study can take 0.1 for π as it would be logical that every topic that needs to be analysed will appear at least in 10% of all the documents. This study makes this assumption because if it appears in less documents it will

probably be too specific and not useful to this study. The y can be set for 0.9 to be 90% sure that this study has all the topics. This would mean that the formula would be:

$$n = \frac{\ln(1-0.9)}{\ln(1-0.1)} = 21.85$$

To be safe, 30 documents can be taken and this criterium can be easily achieved.

Another approach is that of Fugard and Potts (2015), where they created a binomial table to see how big a sample should be. Here they determine the sample size on the base of the desired instances of a theme appearing in the document against the chance that the topic is present in this document. The same probability of a topic appearing in a document can be taken as this study did with formula above which is 10%. For the chance of observing the topic that this study wants, a percentage 90%. 80% is already acceptable in quantitative research, but with 90% more certainty is guaranteed (Kraemer & Kupfer, 2006; Senn & Bretz, 2007). In this case this study would like a theme to occur at least 5 times..This would be an amount for which can be said that it is not just specific for this one M&A announcement and that it will occur often enough to make an extensive dictionary. That would mean according to the table of Fugard and Potts (2015) that this study would need a sample of 78 documents, which is rounded up to 80 within this study.

Table 1.

The sample size that is needed for different population topic prevalence percentages against a desired number of theme instances. In this table there is 90% chance that the desired number of theme (topic) instances is observed. (Fugard & Potts, 2015, p. 675)

Population theme prevalence (%)	Desired number of theme instances							
	1	2	3	4	5	10	20	30
5	45	77	105	132	158	282	515	740
10	22	38	52	65	78	140	256	368
15	15	25	34	43	52	93	170	244
20	11	18	25	32	38	69	126	182
25	9	15	20	25	30	55	100	145
30	7	12	16	21	25	45	83	120
35	6	10	14	18	21	38	71	102
40	5	9	12	15	18	33	61	89
45	4	8	10	13	16	29	54	79
50	4	7	9	12	14	26	48	70
55	3	6	8	11	13	23	44	63
60	3	5	7	9	11	21	40	58
65	3	5	7	9	10	19	36	53
70	2	4	6	8	9	18	33	49
75	2	4	6	7	9	16	31	45
80	2	4	5	6	8	15	28	42
85	2	3	5	6	7	14	26	39
90	1	3	4	5	7	13	24	36
95	1	2	4	5	6	12	22	33

There has been some critique on this model and the way that this model approaches sample sizes. The biggest critique is that you cannot just state a sample size beforehand, as in qualitative research the sample size and the research is often adaptive and emergent and can change based on the information you get (Sim et al., 2018). However, in order to create a dictionary, this study will need to take a sample size because this study is working with a dataset of 3,500 M&A press announcements. I am not able to change or guide information that is already within these press announcements, as it is not an interview that I have conducted. This is downside is not applicable to this research. Therefore a pre-set sample size will be necessary. The binomial table of Fugard and Potts (2015) is a good starting point. In my opinion a bigger sample will be better to create a good dictionary, so the method of Fugard and Potts (2015) will be better than taking the sample size of 21.85 from the model of Viechtbauer et al. (2015) and Galvin (2015).

A random sample from these 3,500 M&A press announcements is taken through the use of the lottery method. This is a method in which numbers are assigned to each document and then randomly numbers are selected that form the sample (Singh & Masuku, 2014). This is a simple but effective method. Some of the disadvantages of this technique are not of concern to this study as there is already a full set of press announcement of which a random sample is drawn. In this case all of the press announcements are equally important and of the same quality so there will be no big quality loss by not selecting some press announcements. The random sample of press announcement are implemented into ATLAS.ti.

These keywords are structured into topics that they belong to with the help of ATLAS.ti. Next, any overlap will be checked to see if topics can be combined. This way this research creates layers. The first base is a broad spectrum of keywords that form the first topics. In the second round certain topics are deleted because of overlap. The last round topics are split up into more topics if these topics are too broad. Appendix A shows the topics from the first, second and third round of selecting. Appendix B shows keywords selected for every topic. An explanation for the meaning of every topic is given in appendix C.

In the first round, I looked for any keywords that would be of interest and assigned a code to each one; this resulted in a very broad dictionary with some very specific topics and others that were not so specific. There was a lot of crossover between the various topics. The first round

was mostly focused on laying a foundation for my dictionary and developing a broad range of topics with a large number of keywords beneath it.

The second round I started to see if certain topics could be combined into one topic. I have combined *opportunities*, *explore*, *exploit*, *additions from the target company*, *synergies* and *reason for the deal* together as *synergies* as this could all be seen as a way to enhance the organization after the M&A. There was a lot of overlap between these subjects because they could all be considered as ways to improve the organization, and integrating them into one would not result in a loss of information when I want to examine what effect this topic has on CARs. *External challenges* and *challenges* have been merged into the topic *challenges faced*. Both deal with challenges and often external and internal challenges are related to each other and result both in a need for change in the organization itself. *Adoptions of new developments* and *innovation* have been merged into *innovation*, because there was a lot of overlap and both are about adapting to new trends or being the first to innovate. *Leadership change* and *holding on to old ways* is also put together as this is mainly about changing or staying the same after the merger or acquisition. This new topic is named *consistency after M&A*. As *clients* are a part of the external environment of a company this topic is also merged together with *external environment*. Lastly, *opportunities* was quite similar to both *opportunities for shareholders* and *synergies*, so the keywords from opportunities are divided between *opportunities for shareholders* and *synergies*.

In the first round, I concentrated on all of the keywords that could be associated to a topic, as well as creating all of the topics that I believed would be relevant. As a result, there is a lot of overlap between topics, as well as a lot of words that are not specifically relevant to one topic. This can make it difficult for the LDA to distinguish specific topics. I removed items from the second round that were unsuitable for my dictionary and research. In the third round, I separated topics that were perhaps too wide to be handled as a single topic into many topics. *Characteristics of the deal* is quite broad and is subdivided into *relationship after deal* and *Take over relation (hostile/friendly)*. External environment is also transformed into *external influencers* as *market growth* already covers a change in the external environment that a company will comment on or address. *Mission* is transformed into *mission/vision* as this is often overlapping in press announcements.

The last step into finishing my dictionary is to look within each topic and make sure that only keywords are assigned to a topic which are very specific for this topic. So all words that appear in multiple topics or keywords that are of a more general nature are deleted in order to make

sure that LDA specifically targets the topics that this study wants to research and does not take other pieces of text into account or assigns pieces of the document to a topic to which it should not be assigned. The topics and keywords that are finally created can be found in appendix B, with an explanation of the topics in appendix C.

The topics are put in the LDA model in order to get output which can be used in the regression analysis. The output of LDA however is shown in percentages for every topic in every press announcement. A threshold needs to be established for deciding whether or not a topic is disclosed within the press announcement. The cutoff point that is used in this study will be a median-split cutoff. If the percentage is below the median, it is stated that the topic is not addressed in the press announcement and if the percentage is above the median-split it is addressed in the median-split. Dummy variables are created for every topic where 1 is assigned to all the percentages above the median and 0 to all the percentages below the median (Field, 2013; Iacobucci et al., 2015). For every M&A announcement these dummy variables are added up to get a scale between 0 and 22. If a press announcements scores 22 points it addresses all 22 topics and if it scores 0 it addresses no topics from the dictionary whatsoever.

3.3.3 Moderators

Information asymmetry. One particularly information asymmetry increasing deal characteristic is the fact that the target is a privately held company. This is for multiple reasons. Firstly, privately held companies are not required to periodically publicly report on their businesses. Secondly, privately held companies are less likely to be known by investors, and hence, acquiring the required information to conduct an assessment is difficult in a time-bound situation like an M&A announcement because the market reacts fast. The database that this study uses shows the characteristics of the targeted company to see if it is public or private. A dummy variable is created in order to measure this in the multiple regression analysis. Subsidiaries who are targeted are also in the database that is used, but this data is removed as the information of a subsidiary fluctuates on the basis of it being a private, public or wholly owned subsidiary.

Market overvaluation. Investors' demands for information and susceptibility to it are lower for companies with a market overvaluation because they believe the company is already on the right track and doing things in a way that will benefit them more in the future (Guo et al., 2020; Tsai, 2017). This study measures this through the book-to-market ratio (Chen & Zhang, 1998; Griffin & Lemmon, 2002; Guo et al., 2020). The book-to-market ratio tells you whether or not the value of a company is higher than its trading value in the book per share. The book-to-

market ratio identifies overvalued or undervalued securities by taking the book value and dividing it by the market value. If the book value is lower than its market value the company is considered to be overvalued. So if this ratio is low that means that the investors have faith in the organization. The book-to-market ratio can be calculated through the total value that shareholders hold at the end of the most recent quarter in equity, this is before the M&A press announcement, and it is then divided by the market value of all the outstanding shares at the end of this same quarter (Guo et al., 2020). For the book-to-market ratio, this study uses the data from the year prior to the press announcement, in order to get a clear idea if the organization is overvalued or not. It is essential to use the data of the year before, because this way the book-to-market ratio is not influenced by the M&A announcement. The book-to-market ratio can show if an organization is overvalued and if there is trust from the investors. Trust can moderate the relation between strategic silence and the reaction of investors to the M&A announcement, because if there is a lot of trust, the organization might be able to disclose less information without their stock market taking a more negative turn. An organization may keep that trust by not sharing specific negative facts, as investors will not be aware of anything negative and will assume that the company is still on the correct track. On the other hand, if later is discovered that certain information was not shared, trust may be severely harmed. As a result of market overvaluation, a firm may be able to deploy strategic silence more efficiently, but it may also be more dangerous. The book-to-market ratio is calculated as followed: $BKVLPS / MKVALT$ within this dataset. Where BKVLPS, and MKVALT are the compustat names for book value and market value.

3.3.4 Control variables

Certain other factors can influence the dependent variable. In order to counter this effect, control variables will be taken into account. CARs are widely used in research to measure certain outcomes, and multiple variables are therefore known to influence CARs. In order to be able to better explain the effect of the hypotheses in this study, these variables are included as control variables to differentiate the main effect from the controlled effect (Aalbers et al., 2021; King et al., 2004). There are several control variables that are used in this research in order to make the predictor coefficient better and more precise. Prior financial performance is controlled because this can have an influence on the stock market. This is measured in return on assets (ROA) (Schijven & Hitt, 2012). It is expected that ROA will have a positive effect on the CARs. The ROA data is lagged before entering in the model. The acquirers experience with acquisitions can cause for a weakened negative effect. Therefore, this research takes the amount

of acquisitions done before the announcement into account (Aalbers et al., 2021; Schijven & Hitt, 2012). This research will also account for the way in which the deal is paid, through stock, cash or a combination of both as this can have an influence on the stock market's response. This is measured through an ordinal scale of 1 being cash only, 2 being a combination of both stock and cash and 3 is for stock only deals (Schijven & Hitt, 2012). It is expected that if the M&A deal is paid for in stock, the company suspects the target to be overvalued. Therefore payment method will be expected to have a negative effect on the CARs as a control variable in this research (Schijven & Hitt, 2012). Geographic proximity can also influence the deal value, in order to see if the cultural and regulatory characteristics are very different or rather similar, this is measured with a three-point ordinal scale: 0 if they are headquartered in other countries, 1 if they are in the same country but not in the same province/state of the U.S. and 3 if they are in the same province or state (Schijven & Hitt, 2012). It is expected that there is a positive correlation with a closer the proximity between the targeted company and the acquirer. Leverage can also influence the potential return on acquisition (Acemoglu et al., 2016; Lang et al., 1991; Maloney et al., 1993). Leverage is known as the use of debt or creating debt in order to amplify your returns from an investment. An investor can make use of leverage to increase their buying power in the market that they choose (Pan et al., 2018). Leverage is lagged as this study wants to see what the effect of leverage is on the CARs. By using leverage from the year prior to the press announcement this study can see what the effect was of the known leverage during the M&A press announcement. It is expected that leverage has a positive effect on CARs (Pan et al., 2018). And lastly this study includes industry similarity as it has been proven that acquiring a company in the same industry can influence the CARs (Aalbers et al., 2021; Certo & Semadeni, 2006; Schijven & Hitt, 2012). This study measures industry similarity through a three-point ordinal scale as well, a score of 2 is given if both companies operate in the same 3 digit Standard Industrial Classification (SIC) code, 1 if they share 2 digits within this code and 0 if they do not meet these requirements (Schijven & Hitt, 2012). Deal value is also often used as a control variable when a study uses CARs as dependent variable, however deal value in the dataset that is used is only known for targeted companies with a public status and since this study want to see the moderating effect of the status of the target company this control variable will not be taken into the regression model.

3.7 Regression

In order to see if there is a relation between the independent variable and the dependent a multiple regression analysis is performed. Multiple regression analysis is chosen for this study

because it can explain the relationship between the difference in information in the press announcement and the CARs, it can also take into account the moderators that I want to use. This study has a large sample size (more than 20 observation for every variable), so there are no problems with generalizability. Skewness and kurtosis are also tested, and a vif-test is conducted to see if there is any multicollinearity issues in the data.

For the first model the following regression model is estimated:

$$\text{CAR}(-1,1) = \alpha_0 + \beta_2 \text{ROA} + \beta_3 \text{ACQUIRER_EXPERIENCE} + \beta_4 \text{PAYMENT} + \beta_5 \text{GEOGRAPHIC_PROXIMITY} + \beta_6 \text{LEVERAGE} + \beta_7 \text{INDUSTRY_SIMILARITY} + \beta_8 \text{TARGET_STATUS (PUBLIC)} + \beta_9 \text{BOOK_TO_MARKET} + \epsilon$$

For the second model the following regression analysis is estimated:

$$\text{CAR}(-1,1) = \alpha_0 + \beta_1 \text{STRATEGIC_SILENCE} + \beta_2 \text{ROA} + \beta_3 \text{ACQUIRER_EXPERIENCE} + \beta_4 \text{PAYMENT} + \beta_5 \text{GEOGRAPHIC_PROXIMITY} + \beta_6 \text{LEVERAGE} + \beta_7 \text{INDUSTRY_SIMILARITY} + \beta_8 \text{TARGET_STATUS} + \beta_9 \text{BOOK_TO_MARKET} + \epsilon$$

For the third model:

$$\text{CAR}(-1,1) = \alpha_0 + \beta_1 \text{STRATEGIC_SILENCE} + \beta_2 \text{ROA_lagged} + \beta_3 \text{ACQUIRER_EXPERIENCE} + \beta_4 \text{PAYMENT} + \beta_5 \text{GEOGRAPHIC_PROXIMITY} + \beta_6 \text{LEVERAGE} + \beta_7 \text{INDUSTRY_SIMILARITY} + \beta_8 \text{TARGET_STATUS (PUBLIC)} + \beta_9 \text{BOOK_TO_MARKET} + \beta_{10} \text{STRATEGIC_SILENCE} * \text{BOOK_TO_MARKET} + \epsilon$$

For the fourth model there is a combination of both hypotheses and the main hypothesis

$$\text{CAR}(-1,1) = \alpha_0 + \beta_1 \text{STRATEGIC_SILENCE} + \beta_2 \text{ROA} + \beta_3 \text{ACQUIRER_EXPERIENCE} + \beta_4 \text{PAYMENT} + \beta_5 \text{GEOGRAPHIC_PROXIMITY} + \beta_6 \text{LEVERAGE} + \beta_7 \text{INDUSTRY_SIMILARITY} + \beta_8 \text{TARGET_STATUS (PUBLIC)} + \beta_9 \text{BOOK_TO_MARKET} + \beta_{10} \text{STRATEGIC_SILENCE} * \text{BOOK_TO_MARKET} + \beta_{11} \text{STRATEGIC_SILENCE} * \text{TARGET_STATUS (PUBLIC)} + \epsilon$$

3.8 Strategy and reliability

The strategy for this research is to see what the general reaction of investors is to an M&A announcement and then compare this to the outcome of different M&A announcements that are missing a topic or missing more than one topic. In this study it can be seen if there is a difference

between the degree of information that is disclosed and if there is a relationship between missing information and the CAR of an organization. A great deal of scholars consider CARs as one of the most effective ways to measure the performance of acquisition under the assumption that there is an efficient market (Haleblian et al., 2009; Kaplan & Weisbach, 1992). Markets and investors are not omniscient and may react only to the information they have at their disposal and not take into account the costs that come with the implementation of an acquisition. In this study I want to take the fact that investors are not omniscient in account by seeing if they react differently if they know less than if they know more. Which is where strategic silence comes in play.

A robustness check is performed in order to test if the same results are achieved using a different variable. The robustness check are conducted using Tobin's q instead of book-to-market ratio. Tobin's q was chosen as this can also measure market overvaluation and is therefore a good replacement for book-to-market ratio in order to see if the other variables still react the same in the regression model. This shall be further discussed in the results section.

4. Results

The findings of this study will be addressed in this section. The findings will be based on the above-mentioned techniques. The findings of the regression analysis will be presented in tables and the appendix. To begin, the LDA will be discussed, which led to the formation of the independent variable on which this study's analysis will be based. Second, the descriptive statistics and correlation matrix will be examined to see if there is any multicollinearity that has to be considered. Following that, the regression analyses will be discussed, as well as the hypotheses that can be accepted or rejected based on these regression analyses. Finally, the robustness check results will be analyzed.

4.1 LDA

For LDA a dictionary is designed with the help of ATLAS.ti that fits the topics that might be of influence on the CARs. These topics have been chosen on the basis of literature and the frequency to which they are addressed or specifically not addressed in the press announcements. This study has compared the semi-supervised LDA with the unsupervised LDA and it shows the unsupervised LDA uses topics that are not of interest to use and are more or less randomly put together. The semi-supervised LDA strategy is the superior alternative for this research because it is more focused on the results that are of interest to this research. Based on the LDA

analysis, a scale is created to determine how informative each article is based on the number of themes it contains. The greatest possible score for an article is 22, as this is the maximum number of topics that the LDA can employ. The informativeness of each press announcement shall be compared by matching the press announcement with each unique SDC number to the database to see what the CAR is for each topic. This allows for a regression analysis to reveal the relationship between the CAR and the informativeness of each M&A press release. During the coding of press announcement, it became evident that there are significant differences in the informativeness of press announcements. Some press announcements were very short and contained only the bare minimum of information that was needed to announce that an acquisition or merger was/will be performed. Other press announcements described in full detail the relationship between both companies, the origin, their specialization and so on. It also became clear that companies often use the same strategy when it comes to press announcements, for instance the company Arthur J. Gallagher & Co always discloses the bare minimum in its press announcements.

The initial stage was to read all of the press statements and convert them into a data file that contained information so that it could be linked to the data in the dataset. The LDA was then inspected to ensure that only private and public entities were included. All M&A announcements involving subsidiary firms were removed because they will not be considered in this study. Through eliminating the subsidiary M&A announcements, this research removes the risk of the LDA picking up topics that are in any way specific to the merger or acquisition of a subsidiary company. A lot of articles contain names of companies or people, which were all filtered out as they do not contain any information that is relevant for the LDA or this research. Then all text was converted to lower cases, all stop words were removed from the text, punctuation was removed and all numbers were removed. After that stemming was applied in order to make sure that all words had the same base and were transformed to their root forms. The minimum frequency for words was set to 5 so it had to occur at least 5 times or else it would not be taken into account. The data was then transformed into a document-term matrix.

The LDA gives a percentage of the topic being present within a certain press announcement. To measure the informativeness of a press announcement there needs to be a threshold to every topic and whether or not this topic is present within the press announcement. As a result, for each topic, median-split dummies have been created that score zero if the topic percentage is below the median and one if the topic percentage is above the median (Field, 2013; Iacobucci et al., 2015). This will be done for all 22 topics, after which a new variable will be created that

combines all the variables with their score to get a variable that ranges from 0 to 22 according to the amount of topics that it covers.

The CaoJuan2009 model, which should give a low value for the proper amount of topics, and the Deveaud2014 model, which should give a high value for the suitable amount of topics that should be taken to execute the LDA, were also used to perform the open unsupervised LDA using R. The final number of topics picked was four. According to these models, this is the best number of themes (appendix D). For the unsupervised LDA an alpha of 0.2 was used and 500 iterations (Cao et al., 2009; Deveaud et al., 2014). 4 topics is nowhere near the number of topics this study discovered from coding the press releases, and hence will not suffice for this study as it is interested in all topics that might influence CARs. As a result, unsupervised LDA is not the best option for this study. The open unsupervised LDA results also revealed a lot of overlap. For example, there were a lot of keywords scattered over different topics linking to healthcare, and there was no meaningful method to define topics that could influence CARs.

4.2 Descriptives and multicollinearity

A correlation matrix was built to ensure that there was no multicollinearity that could influence the outcomes of this study. All of the variables in this correlation matrix were studied to determine if there was any type of multicollinearity. This was done to see if there were any variables that were connected to each other and could cloud the analysis of the hypothesis. Multicollinearity can tell you whether there is a linear relation between two or more of your variables (Alin, 2010). If there is multicollinearity this can cause serious problems with the reliability of your research and estimating the model parameters. VIF scores indicate, in a quick oversight, if there is any multicollinearity that needs to be addressed and can cause a problem. If the VIF score is above 10, this indicates that there is a serious problem with this variable and you do not want to use this (Field, 2013). A VIF score that is substantially bigger than two can be a cause for concern and show that the regression might be biased (Field, 2013; Schijven & Hitt, 2012; Studenmund, 2014). The highest VIF score within this research is 2.034 which indicates that there is no multicollinearity in the regression analysis (Aiken et al., 1991; Field, 2013; Lim et al., 2013). The Correlation table also shows no cause for concern.

Because the assumptions for a regression analysis are met, the choice for a regression analysis is legitimate for this data and research. The data used has a normal distribution, which can be seen in the histogram in appendix F. Except for the acquirer experience, which was converted using the log10 transformation to lessen the positive skewness, the variables are not

substantially skewed negatively or positively. For skewness, all of the other variables are between -1 and 1, which is acceptable.(Field, 2013). There are no outliers that are influential as Cook's distance has a maximum of 0.019 which is far below the value of 1, the value of 1 can be seen as a threshold for Cook's distance to start taking out influential outliers (appendix E) (Field, 2013). All standardized residuals with a value of 3.5 or more or values below -3.5 have been removed as these are outliers who could influence the data and regression analysis.

The standardized residuals which are left have a maximum and minimum value that is measured at -3.195 and 3.162 which can be seen as acceptable (appendix E). There are only 12 observations which are above 3 or below -3. With the fact that Cook's distance is very low, these potential outliers have been observed but there is no necessity in deleting them as they may still contain useful information and outliers are not necessarily problematic (Buzzi-Ferraris & Manenti, 2011; Field, 2013). In order to see if for any two observations residual terms are correlated the Durbin Watson test can be conducted. Residuals should be uncorrelated, which is the case as the Durbin Watson test is 1.866 according to the Durbin-Watson table (Bartels & Goodhew, 1981; Field, 2013; Watson & Durbin, 1951). The data that is used in this research is also homoscedastic as the scatterplot has an equal division, there is no sign of a funnel or other shape in the scatterplot. A sample size of 1676 is also far above the minimum sample size recommended for a regression analysis (Field, 2013).

Table 2.

descriptive statistics and correlations

N=1676

<i>Variables</i>	<i>Mean</i>	<i>s.d.</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>
<i>1</i> Cumulative abnormal return	0.05854	2.023											
<i>2</i> Strategic silence degree (number of topics)	0	3.75395	-0.012										
<i>3</i> Return on assets lagged	3.48E+14	3.14E+14	-0.03	0.007									
<i>4</i> Acquirer experience(log10)	1.6991	0.56768	0.002	0.333	-0.015								
<i>5</i> Payment method	2.66	0.71	-0.03	0.063	-0.063	0.186							
<i>6</i> Geographic proximity	0.81	0.607	0.013	0.034	0.071	-0.009	-0.139						
<i>7</i> Leverage	4.14E+14	2.95E+14	0.052	0.284	-0.01	0.33	0.089	0.007					
<i>8</i> Industry similarity	1	0.953	0.003	0.101	-0.046	0.053	-0.074	0.053	0.066				
<i>9</i> Target status (public)	0.111	0.3142	-0.086	-0.054	0.05	-0.165	-0.531	0.115	-0.025	0.107			
<i>10</i> Book to market ratio	-1.42E-02	2.20E+14	0.054	0.072	0.083	-0.153	-0.026	0.034	0.033	0.038	-0.006		
<i>11</i> Book to market * strategic silence	5.93E+13	6.49E+14	-0.003	-0.54	-0.012	0.05	0.042	-0.032	-0.022	-0.075	-0.035	-0.11	
<i>12</i> Target status (public) * strategic silence	-0.064	0.1941	0.068	0.078	-0.027	0.111	0.392	-0.086	0.02	-0.079	-0.761	-0.009	0.03

4.3 Regression analysis

In order to conduct a regression analysis I had to center the variables book-to-market ratio and strategic silence in order to create a good interaction variable. Through centring the variables, before creating the interaction, a better result is achieved. Centring does not interfere with the regression coefficient interpretation. Centring also helps against multicollinearity (Shieh, 2011). The results of the regression analysis are shown in table 3. The CAR that is used, uses an event window of three days. Model 1 contains the control variables, these are chosen on the basis of other research which stated that these have an influence on CARs. I control for these to increase the internal validity of this study. As stated before, the acquirer experience was log transformed in order to solve the skewness of this variable. Return on assets was lagged to get a clear results of the prior financial performance. Payment method, geographic proximity and industry similarity have an ordinal scale as stated before in the methodology section. Model 2 includes the effect of strategic silence on CARs, without the interaction effect included. The interaction effect of market overvaluation is considered in model 3, and the effect of information asymmetry is considered in the form of the target's status in model 4. The book-to-market ratio is used to detect market overvaluation. The book-to-market ratio was first lagged in the dataset to ensure that this study uses the book-to-market ratio from the year prior to the announcement. This ensures that the book-to-market ratio is unaffected by the press announcement and provides a clearer picture of how investors see the company. Dummy variables were utilized to account for information asymmetry, and I used a public target as a dummy variable in the regression model.

For hypothesis 1, model 2 is of importance as this shows the effect between strategic silence and CARs. The hypothesis predicted that strategic silence would have a negative effect on the CARs. This would mean that the coefficient of model 2 for strategic silence would show a positive effect. The reason that this study is looking for a positive effect is because strategic silence is in this study measured in a reverse way. If the variable of strategic silence increases this means that the information in the press announcement increases as well. A positive effect indicates that the dependent variable changes in the same direction as the independent variable. The beta coefficient however shows a negative coefficient which would indicate that strategic silence does have a positive effect on CARs, however the effect is not significant. So if a company discloses less information the CAR goes down. The fact that the effect is not significant means that hypothesis 1 cannot be accepted.

For hypothesis 2, model 3 has to be analysed. Hypothesis 2 stated that the effect of strategic silence would be weakened if the company is overvalued because investors have more trust in

the company and the strategy that the organization uses. This study therefore expected a negative coefficient in the third model with the interaction effect between strategic silence and book-to-market ratio, which is used in this research as a measurement to see if an organization is overvalued. A negative effect was expected, because when the book-to-market ratio rises the effect of strategic silence should have less influence. The beta coefficient for this variable is very low but negative which would indicate that there is a negative influence on CARs but almost neglectable, especially if you take into consideration that the standardized beta coefficient is -0.001. The variable is not significant either so this study cannot accept the second hypothesis as there is not enough evidence of an effect on CARs. The fact that the coefficient is very low and negative indicates that there is no big relationship for this interaction with the dependent variable. Strategic silence and book-to-market both separately do have a beta coefficient which shows there is an effect (although for strategic silence this is not significant). For the third hypothesis this study needs to look at the interaction effect between strategic silence and information asymmetry, measured through the status of the targeted company, on CARs. The interaction effect was measured with a dummy variable which in this case is public companies. The hypothesis stated that if the company was public this would have weakened the negative effect of strategic silence and have a positive influence on the CARs. That is not the case in this study. The coefficient is positive which shows that the CAR is positively influenced by the interaction effect. Because strategic silence has a negative effect on CARs in this study, it must mean that the public status of the targeted company also has a negative impact as the both are combined and two negative coefficients combined create a positive coefficient. However the interaction is not significant, so this hypothesis can also not be accepted.

The control variables, which are significant payment method, leverage, target status and book-to-market ratio all responded as predicted. Each of these variables show coefficients that are confirming what literature already stated about these variables. The payment method shows a negative coefficient which would indicate that there is indeed a negative effect of payment in stock on the CARs, possibly due to a suspicion of overvaluation of the targeted company (Schijven & Hitt, 2012). Leverage positively attributes to the CARs as it can be used to increase the potential ROI (Pan et al., 2018). Book-to-market ratio also shows a positive coefficient which indicates that investors are willing to pay more for the company than its book value (Griffin & Lemmon, 2002). It should also be noted that although leverage, return on assets and book-to-market ratio as control variables have a very low unstandardized beta coefficient, their standardized coefficients are actually not that small at all for explaining part of the CAR which indicate that their impact in comparison to the other variables is not as small as the

unstandardized coefficient would suggest.(Leverage: 0.066, Return on assets: -0.034, Book to market : 0.053).

<i>Variables</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>
<i>Constant</i>	0.922*** (3.195)	0.839*** (2.841)	0.839*** (2.839)	0.830*** (2.808)
<i>Acquirer experience</i>	-0.051 (-0.54)	-0.016 (-0.158)	-0.015 (-0.157)	-0.012 (-0.121)
<i>Payment method</i>	-0.306*** (-3.705)	-0.306*** (-3.706)	-0.306*** (-3.704)	-0.305*** (-3.687)
<i>Geographic proximity</i>	0.057 (0.691)	0.060 (0.738)	0.060 (0.737)	0.061 (0.740)
<i>Leverage</i>	4.123E-16** (2.323)	4.563E-16** (2.528)	4.563E-16** (2.527)	4.557E-16** (2.524)
<i>Industry similarity</i>	0.006 (0.107)	0.011 (0.207)	0.011 (0.206)	0.011 (0.203)
<i>Return on assets</i>	-2.266E-16 (-1.394)	-2.254E-16 (-1.387)	-2.254E-16 (-1.386)	-2.278E-16 (-1.401)
<i>Target status</i>	-0.931*** (-5.003)	-0.934*** (-5.021)	-0.934*** (-5.019)	--0.833*** (-3.744)
<i>Book-to-market ratio</i>	4.486E-16** (1.968)	4.823E-16** (2.106)	4.832E-16** (2.105)	4.897E-16** (2.132)
<i>Strategic silence (Number of topics addressed)</i>		-0.019 (-1.332)	-0.019 (-1.315)	-0.020 (-1.358)
<i>Strategic silence * book-to-market ratio</i>			-8.174E-19 (-0.011)	-1.713E-18 (-0.022)

<i>Strategic silence</i>				0.263
<i>* target status</i>				(0.826)
<i>Number of observations</i>	1676	1676	1676	1676
<i>R squared</i>	0.23	0.24	0.24	0.24
<i>Adjusted R squared</i>	0.018	0.018	0.018	0.018

Note, *, **, *** denote a significance of 10%, 5% and 1%.

T value between parentheses

4.4 Robustness checks

To test if the regressions done are robust, a similar regression analysis will be run with a different variable to see if the claims that can be made from the primary regression study are still valid. I'll run a regression analysis in which I replace the moderator's book-to-market ratio with Tobin's q. Both are used to highlight a company's overvaluation. The parameters that change here are book value (for the book-to-market ratio) and replacement costs (for Tobin's q). Book value is calculated using the original cost of the asset that is bought and takes into account depreciation, amortization and depletion. Replacement cost is the cost of replacing an object in the same condition as it was before it needed to be replaced, taking into account current wear and tear (Musumeci & Peterson, 2011). If the results remain the same after changing the regressor, I can argue that the model is robust and will hold even if one of the variable is altered. There are no significant changes in the regression in this scenario (appendix G). As a result, the model can be said to be robust, albeit this does not negate the fact that the hypotheses cannot be accepted.

5. Discussion

Organizations have a variety of strategies to choose from in order to influence their investors. Prior studies have already researched a lot of these strategies linked to impression management (Allen & Caillouet, 1994; Jin et al., 2021; Leung et al., 2015). This study sought to examine what the effect is of the degree of information that is released in press announcements by organizations and what the effect is of deliberately withholding information. By drawing on the theory of strategic silence within the impression management theory a link was sought between

the degree of information and the cumulative abnormal return. This research was further extended through researching the relationship of information asymmetry and market overvaluation on strategic silence within the concept of M&A announcements. I added public or private status of the targeted company to test if investors would react differently to strategic silence if they already had less information. Market overvaluation was included to determine if the relationship between strategic silence and cumulative abnormal return is affected by market overvaluation.

The theory of this study anticipated that strategic silence would have a negative impact on CARs, but that organizations adopt it as a damage-control tactic because exposing that information could cause more harm than purposely concealing it.

5.1 Conclusion

This research tries to find an answer to the question if strategic silence within M&A press announcements has an effect on the cumulative abnormal return. In order to investigate this semi-supervised LDA is used instead of an unsupervised LDA. The reason for a semi-supervised LDA is that this gives a more focused approach, which this research considers more valuable than the unbiased approach of an unsupervised LDA approach. However, an unsupervised LDA was done to ensure that no important topics were overlooked. The unsupervised LDA performed at its best with four topics, and there was a lot of overlap between these topics, for example, a lot of topics had healthcare related keywords within them. As a result, the semi-supervised strategy was a better way to distinguish topics from one another and to identify topics that might have an impact on the cumulative abnormal return. The use of semi-supervised LDAs by first developing a dictionary using qualitative research methods is a new method, but it appears to be a useful strategy to separate specific topics before running an LDA.

Impression management is a thoroughly researched theory with many side branches to smaller theories. Within impression management, strategic silence is fairly new and not yet well researched. The studies that do research strategic silence within organizations however show some interesting results (Carlos & Lewis, 2018). Deliberately withholding information as a strategy can be just as influential as disclosing extra information. The theory surrounding impression management and strategic silence showed promising signs for this study to be able to prove that strategic silence has an impact on the cumulative abnormal return when this strategy is used within press announcements. The fact that strategic silence is utilized in a multitude of sectors and is being employed by organizations, shows that this technique will

most likely be used in mergers and acquisitions as well. The interaction between market overvaluation and strategic silence was claimed to weaken the relationship between strategic silence and cumulative abnormal return, because with increased trust, information would be valued less since investors' perceived risk would be lower. On the other hand, the interaction effect of information asymmetry should amplify the effect of strategic silence, as a baseline of less information would raise investors' need for more information. The hypotheses in this study, however, cannot be accepted because they are not significant. There is no significant evidence that strategic silence or the interaction effects affect CAR. The public or private status of the targeted company even had the opposite effect of what the hypothesis predicted. Fuller et al. (2002) stated that targeting a public organization has a negative effect on strategic silence, which seems to be the case in this study as well. The status of the targeted company probably has a larger effect on CARs than the information asymmetry between private and public companies has. However, because the effect is not significant we cannot determine for certain what the real effect is.

5.2 Theoretical implications

This study adds to the impression management theory by extending on this theory through the scope of strategic silence. This combination was first done by Carlos and Lewis (2018) and this work extends on this research by expanding to the field of M&A. It shows a side of impression management which focuses on withholding information instead of changing information or disclosing extra information to alter the outcome of a certain result. This study shows that in the context of M&A and the concept of the impression management there is still a lot of options to influence investors.

This research also gives a clearer definition of strategic silence as a strategy within the context of M&A announcements and the way in which strategic silence can be used. It highlights the different aspects that might be of influence on this strategy. The definition of strategic silence within organizations and the clearer definition of how it can be used as a strategy are achieved by combining prior research on strategic silence and impression management. It also shows the differences between strategic silence and other strategies within the impression management theory. The effects of withholding information can be just as influential as disclosing information but is harder to measure as it is simply not there. The interaction between strategic silence, market overvaluation and information asymmetry was also researched to see if there are other factors that might influence strategic silence. M&A research has to take a lot of factors into account when conducting research as this is a topic that is influenced by a lot of different

factors. By conducting research into strategic silence and different interaction effects with strategic silence this study added theory to a relatively new topic within the M&A theory.

This research tried to research strategic silence through a combination of methods. The unsupervised LDA was a good way to direct LDA towards a viable result within this study. The combination of creating a dictionary through the coding of a random sample and using this in LDA turned out to be working. This way of preparing LDA can add to the future research as a way to focus topic modeling. By still performing an unsupervised LDA the advantage of an unbiased LDA are not lost as you can compare the two models with each other.

5.3 Practical implications

This study aimed to be of practical use to managers and the board of an organizations by providing insights in the role of information in press announcement on cumulative abnormal return. Organizations are constantly looking for ways to generate more revenue or increase the value of their stock. In order to stay viable and survive an organization has to be able to be as efficient as possible. M&A's are extremely complex and there are a lot of factors that need to be taken into account. Done right, a M&A can cause a lot of benefits. For an organization all the benefits that it can reap can be of importance. Knowing how much information is beneficial for an organization can keep it ahead of its competitors. This study tried to show what degree of information would be most beneficial to disclose within a press announcement, and whether the organization should disclose more or less information in order to get the highest return and raise the value of its stock. Through the coding that was done within the sample of press announcement, it became evident that there is a lot of difference within press announcement. Some companies prefer to keep it short and simple while others disclose a lot more information than is required by law. The results of this study were, however, not significant so no real evidence can be presented in favour of disclosing more or less information. However, the theory surrounding strategic silence and the provision of information does suggest that it is better to disclose more information. If you do not have the information or it is a problem you don't want to address right now, it is probably best to say you are working on the problem and will reveal more information or provide a solution in the near future to give your investors the impression you are working on it and looking for a solution that will benefit them.

5.4 Limitations and future research

Although this research is carefully conducted with regards to the methodology and the theory behind the hypotheses, there will always be limitations to this research or any research for that matter. Strategic silence within the context of M&A is studied and this study uses the S&P 500

index to do this. It might be interesting to see if other indexes in the world result in a different outcomes. This study is an event study that examines how missing certain information affects the stock market at a specific point in time. It does not, however, assess the long-term impact of strategic silence. More research might be conducted on the same firms to see if they release the information they withheld during the acquisition announcements at some point in the future. It will be interesting to see if providing the information at a later date has an impact on the stock market, as well as why companies chose not to provide this information in the first place.

The use of LDA in combination with regression analysis has had many advantages within this study as LDA was a great way to analyze a large part of the press announcement. The semi-supervised LDA produced observations that could easily be used. However, the informativeness of press announcement has to be determined and a threshold has to be made to decide if a topic is addressed or not within a press announcement. In this research this was done through the use of a median-split. This worked for this research but there will be topics included within this research which might not actually be addressed or could not include some topics that in fact were addressed in the press announcements. Future research could try to find a better way to define a threshold to state that a topic was addressed. Another problem with the approach in this research is the creation of the dictionary, which will always contain some bias. The dictionary that was created was created by myself and will therefore contain keywords that are of importance according to my interpretation. Keywords that might indicate certain topics to me which seem important might be less important to someone else. It will also be influenced by the random sample that is drawn, as this may be a sample in which some part of the press announcements is not represented.

Within the context of strategic silence and used topics, it would be interesting to see if including a specific topic has an effect on the CAR. So a more specialized study in which the effect of each topic on CARs is measured. A limitations that has to be considered when using CARs is that they are a good measure for event studies like this study, but there is no way to filter out all of the noise that might influence CARs. A large amount of observations and a small window can limit this to a minimum but there might still be some influence on observations from other events.

Within the dataset a lot of M&A's were performed with targeted companies who had a subsidiary status. These were deleted from this sample as they were too fluctuating in information asymmetry as this was depending on a lot of different circumstances. If the targeted company was a wholly-owned subsidiary, for example, it would have been required to disclose

different information to the public than if it was a public or private subsidiary that was partially owned by the parent company. There was however a big loss of data by excluding this data. For future research these might be taken into account to see if there are changes within the outcome.

Lastly, a limitation of this research is that it is a master thesis. Considering the time frame of a master thesis, a limited amount of time that can be spend on research and results. To the best of my abilities I tried to conduct a thorough research on strategic silence, but there will always be shortcomings considering this research.

6. Ethics

In this research, to the best of my abilities, I report things in the way that they are shown in my results and methods. I have an open mind to all the possible outcomes and do not tamper with the results in order to get the result that I want. The methods that I use have scientifically been proven in other research before and are conducted in an appropriate way. The methods that I have chosen are, in my opinion, a good way to test the hypotheses that I want to research.

The data that this research uses is all public data gathered from news articles and the S&P 500 index. There is no need to censor any private information and there will be no violations of privacy within this research. The research that will be done will also not be guided by any non-scientific matters such as political or corporate goals, and will be conducted objectively.

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Appendix

Appendix A

Topics first round	Topics second round	Topics third round (final dictionary)
Acquisition experience	Acquisition experience	Acquisition experience
Additions from targeted company	Business strategy	Business strategy
Adoptions of new developments	Challenges faced	Challenges faced
Business strategy	Characteristics of the targeted company	Characteristics of the targeted company
Challenges faced	Characteristics of the deal	Relationship after deal
Characteristics of target company	Competition	Takeover relationship (hostile or friendly)
Characteristics of the deal	Divestitures	Competition
Clients	Expertise	Divestitures
Competition	External environment	Expertise
Details of the deal and taking over of the company	Financial status	External influence
Divestiture	Financials of the deal	Financial status
Expanding business	Geographical reach	Financials of the deal
Expertise	Consistency of M&A	Geographical reach
Exploit	Innovation	Consistency of M&A
Explore	Market growth	Innovation
External challenges	Mission	Market growth
External environment	Position in the market	Mission/vision
Financials of the deal	Opportunities for shareholders	Position in the market
Financial status	Relationship before the deal	Opportunities for shareholders
Fit	Sustainability	Relationship before the deal
Geographical reach	Synergy	Sustainability
Holding on to old ways		Synergies
Industry consulting		
Industry technology		
Innovation		

Leadership change		
Market growth		
Mission		
Opportunities		
Opportunities for shareholders		
Position in the market		
Reason for the deal		
Relationship between both companies before deal		
Sustainability		
Synergy		
Takeover of employees and work		

Appendix B

Keywords per topic

acquisition experience	business strategy	challenges faced	characteristics of targeted company	relationship after deal	takeover relationship (hostile or friendly)
acquisitions	approach	bottlenecks	advantageously	working together	hostile
experience	business plan	changing	benchmarking	affiliated	friendly
familiarity		disruption	competitive	agreement	takeover
know-how	plan	pressure	diversified	alliance	
portfolio	strategy	problems	infrastructure	collaboration	
sequencing	unsurpassed	shift	leading	stand-alone	
		struggling		wholly-owned	

competition	divestitures	expertise	external influence	financial status	financials of the deal
challenger	demergers	experience	client-based	accretive	bridge

competition	deprivation	expertise	clients	amortization	cash
	divest	experts	community	annualized	consideration
competitiveness	divestitures	professional	consumers	balance sheet	debt-to-capital
dominating	divestment	skilled	customers	capital	fund
monopoly	take-over		environment	cost-management	offer
rival			external	depreciation	payment
			transforming	fiscal year	purchase
				profitability	shares
					stock
					traded
					transaction

geographical reach	consistency after M&A	innovation	market growth	mission/vision
Australia	continue	accelerate	attractive	ambition
based	course	adoption	dynamic	future
China	employees	advancing	expand	ideas
European	maintain	benchmarks	growth	mission
geographic	remain	cutting-edge	incremental	quest
global	resuming	deepened	rapidly	strive
globalize	retaining	develop		vision
locations		developing		
offices		development		
presence		enhancement		
regional		improve		
United States		innovate		
		next-generation		
		optimize		
		re-invent		
		revolutionary		

opportunities for shareholders	position in the market	relationship before deal	sustainability	synergies
compelling	biggest	collaborating	clean	align
premium	largest	competitors	climate	alignment
shareholders	leader	existing	environmental	benefit
dividend	leading	friendly	greenhouse	bolsters
payout	monopoly	independently	healthier	broaden
valuation	positioned	joint venture	planet	Broadening

	reputation	partnership	sustainability	chances
		relationship	sustainable	complement
				complementar y
				deepening
				efficiencies
				enhance
				expand
				extension
				fit
				potential
				reinforcing
				strengthens
				Synergies

Appendix C

Defining the codebook:

In order to distinguish relevant results the topics had to be established that would be relevant for this study. The main target of the codebook that was formed in order to define the topics was that it had to be able to indicate the informativeness of the press announcements. The informativeness had to be based on characteristics of the targeted company, the acquiring company, the deal itself and things that might be of importance to the investors. Below is a description of each topic and what it addresses. The subjects are chosen based on how they are mentioned in the press announcement and whether they have been included in multiple press announcements. Topics may be picked because they appear in many announcements or because they are mentioned in both the literature and multiple announcements..

Definitions:

Acquisition experience: Acquisition experience is about the prior experience that an organization has within acquiring organizations. Some organizations state this in their press announcements. A statement concerning experience is often mentioned in combination with the fact that they already have experience in the branch that they are acquiring. Acquisition experience has proven to be of influence on CARs (Schijven & Hitt, 2012).

Business strategy: Business strategy refers to the plan that a firm employs to reach a specific objective. This could be a unique approach or a business strategy that the organization has already discussed with investors. This may be of interest to investors because it gives them an idea of the organization's plans and whether or not they agree with them. It also indicates how the business intends to achieve its mission/vision.

Challenges faced: Challenges faced is mainly about internal or external problems that the organization has to counter. This could be due to the introduction of new technology or internal obstacles. If the targeted company provides a solution to the problem, an M&A deal could be

a good way to solve these challenges. Investors are interested in learning about challenges because they provide insight into the company and the environment in which it operates. M&As have also been demonstrated to be influenced by internal and external problems, which can cause an M&A deal to fail or flourish (Nachescu et al., 2010).

Characteristics of the targeted company: The targeted firm's characteristics are primarily concerned with what makes the targeted company appealing. It's possible that the target is extremely competitive in its line of work or that it has access to cutting-edge technology. This may have an impact on CARs because it informs investors about the type of company or organization they are purchasing. It has also been proven that for different characteristics of the target company different M&A strategies should be used and that this should be taken into account (Lin et al., 2015).

Relationship after deal: The relationship after the deal is mainly about the way in which they work together after the deal is done. The organization that has been acquired can function as a stand-alone or a wholly owned company. It can be that the acquisition will be completely integrated into the acquiring company or that it is still able to function as a separate entity.

Takeover relationship (hostile or friendly): This is about the bid that has been done on the targeted company. It can be that the acquiring company performed a hostile takeover or it was a friendly one in which both parties agreed to the merger or acquisition. The fact that is a hostile takeover can have an effect on the returns of the deal (Baradwaj et al., 1990). Losses are often larger for hostile deals (Servaes, 1991).

Competition: Competition is about the competitors in the market and if the acquiring or targeted company are dominating in this market and have a monopoly or if there are a lot of competitors active in their industry.

Divestitures: If an M&A is performed some part of this deal may not be beneficial to the acquiring company or some part of the deal may replace part of the existing business of the acquiring company. It might be better for the acquiring company to divest in this case. This might have a bad influence on the organization or the integration process. It can also be that an organisation divests beforehand in order to acquire or merge with an organization in another industry. (Capron et al., 2001; Kaplan & Weisbach, 1992).

Expertise: Expertise refers to an organization's expertise of its field of work or business. It's also about the experience and skills that its employees, or the targeted company's personnel, may have. It is useful to the organization to have good expertise or to acquire a company with good expertise or experience.

External influence: This is mainly about the external environment of the organization. This is different from challenges faced as it focuses more on the community it is active in and the clients and consumers it has (Nachescu et al., 2010).

Financial status: All of the information that the acquiring firm reveals about itself and the targeted company is included in the financial status. This could be, for example, revenue from the previous fiscal year, as well as depreciation. This may be of interest to investors because it demonstrates the organization's overall health. It could also indicate that they are doing well because they are willing to share their financial situation.

Financials of the deal: the financials of the deal are all about how the deal is financed and everything else that needs to be considered with deal financials. If an acquisition is financed with stock rather than cash, it may send a negative signal to investors because the organization likely believes the target firm is overvalued (Schijven & Hitt, 2012).

Geographical reach: Geographical reach is about the countries and regions that the organization is active in.

Consistency of M&A: The consistency of the M&A is about internal changes made after the M&A has been completed. This is about whether or not they keep the same board of directors and the same management team. It is also about whether or not there will be layoffs within the organization after the deal. It is often seen that there is a high turnover because of an acquisition which could have a negative effect on the acquisition (Krug & Aguilera, 2004).

Innovation: Innovation is about new R&D developments within organizations. Whether or not they will invest in new technologies and optimize their current business. It has been proven that the cumulative abnormal return is higher for R&D intensive firms and that investors favour it if the acquiring company is R&D intensive (Dutta & Kumar, 2009).

Market growth: This is about the market and whether or not it is growing and an attractive market to operate in.

Mission/vision: Mission/vision shows the goal of the organization and what it wants to achieve and why it wants to achieve this.

Position in the market: The topic "position in the market" refers to their current position inside the market in which they operate in. They could be the largest or the most influential company in this market or most innovating (Lin et al., 2015).

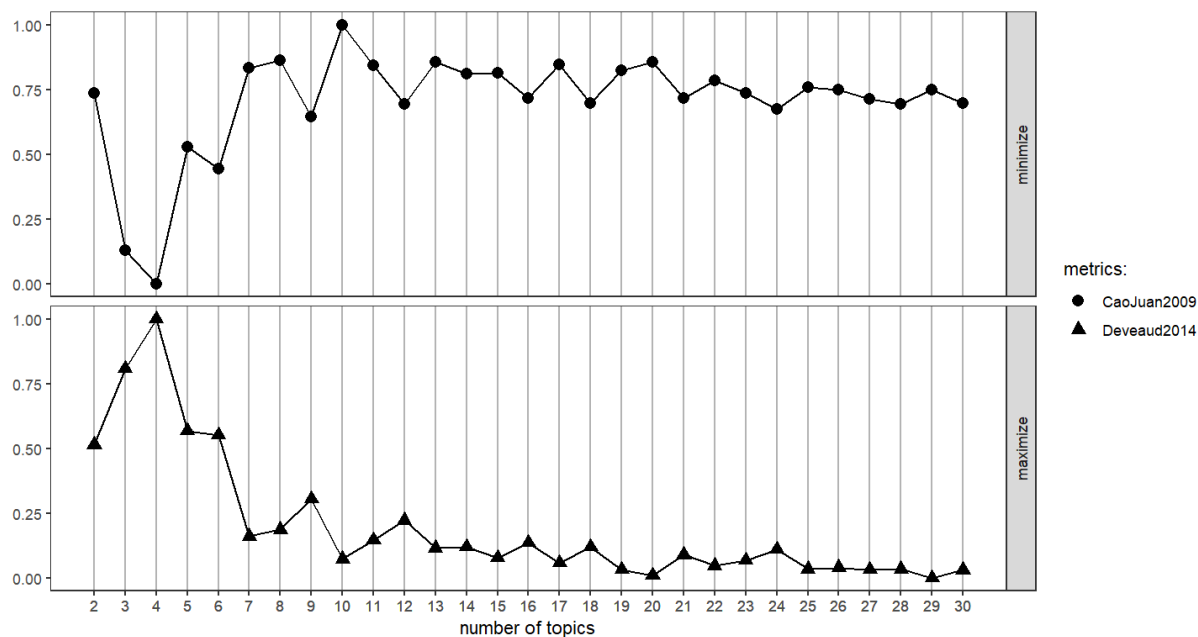
Opportunities for shareholders: The attractive opportunities that the deal provides for the shareholders of the company. This is of interest to investors as it shows them what they can gain from the M&A deal.

Relationship before the deal: The relationship before the deal addresses if they were already operating together in a joint venture, for example, or if they were competitors. They may already know each other, which could be beneficial, or they may be competitors who can benefit from the arrangement by gaining a larger market share (He et al., 2020; McCarthy & Aalbers, 2022).

Sustainability: Sustainability is about all the green initiatives that the organizations are trying to achieve or green initiatives that they are working on.

Synergies: Synergies is about all the characteristics of both organizations that could enhance each other. It shows how the addition of the targeted company benefits the acquiring company and how they can exploit each other. Trying to perform an acquisition in order to exploit the capabilities of the targeted company can cause for positive reactions from investors (Aalbers et al., 2021; Chen et al., 2021; Dutordoir et al., 2014).

Appendix D



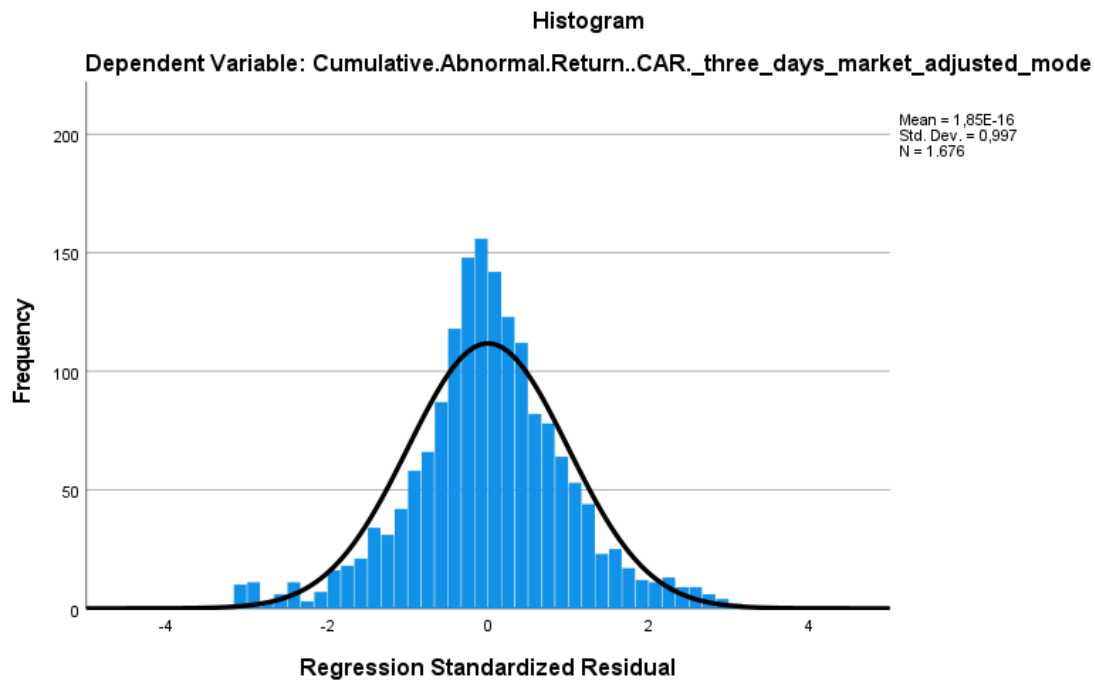
Appendix E

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-1,261172771	1,1946281195	,05853655647	,31380529022	1676
Std. Predicted Value	-4,206	3,620	,000	1,000	1676
Standard Error of Predicted Value	,075	,323	,162	,050	1676
Adjusted Predicted Value	-1,318773985	1,2598209381	,05864498453	,31418547354	1676
Residual	-6,410238266	6,3421101570	,00000000000	1,9994460869	1676
Std. Residual	-3,195	3,162	,000	,997	1676
Stud. Residual	-3,212	3,171	,000	1,001	1676
Deleted Residual	-6,478479862	6,3817243576	-,0001084281	2,0177626417	1676
Stud. Deleted Residual	-3,221	3,180	,000	1,002	1676
Mahal. Distance	1,351	42,333	10,993	7,850	1676
Cook's Distance	,000	,019	,001	,002	1676
Centered Leverage Value	,001	,025	,007	,005	1676

a. Dependent Variable: Cumulative.Abnormal.Return..CAR_three_days_market_adjusted_mode

Appendix F



Appendix G

Regression analysis for robustness.

<i>Variables</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>
<i>Constant</i>	0.870***	0.816***	0.794***	0.787***
<i>Acquirer experience</i>	-0.060	-0.037	-0.024	-0.022
<i>Payment method</i>	-0.302***	-0.303***	-0.305***	-0.303***
<i>Geographic proximity</i>	0.063	0.065	0.065	0.065
<i>Leverage</i>	4.738E-16***	5.061E-16***	5.370E-16***	5.369E-16***
<i>Industry similarity</i>	0.005	0.01	0.015	0.015
<i>Return on assets</i>	-1.627E-16	-1.619E-16	-1.644E-16	-1.665E-16

<i>Target status</i>	-0.908***	-0.913***	-0.923***	-0.832***
<i>Public</i>				
<i>Tobin's q</i>	5.551E-16*	5.310E-16*	5.832E-16*	5.815E-16*
<i>Strategic silence</i>		-0.014	-0.013	-0.014
<i>degree</i>				
<i>Information</i>			1.267E-16	1.277E-16
<i>*Tobin's q</i>				
<i>Strategic silence</i>				0.241
<i>* target status</i>				
<i>Public</i>				
<i>Number of</i>	1676	1676	1676	1676
<i>observations</i>				
<i>R squared</i>	0.022	0.023	0.024	0.024
<i>Adjusted R</i>	0.017	0.017	0.018	0.018
<i>squared</i>				

Note, *, **, *** denote a significance of 10%, 5% and 1%.