



# Do investors underreact to stock swap merger announcements that are made on Fridays and high-distraction days?

Evidence of transactions made between U.S. firms from 1994 to 2014

Finance

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**Abstract**

The topic of *limited investor attention* and its effects on capital markets, has increasingly captured the focus of researchers in recent literature. According to the studies, observed market underreactions to various corporate announcements may be attributable to reduced levels of investor attention. In these models, investor attention is regarded as a cognitive limited resource, whereby the presence of external stimuli and conditions can lead to a situation where investors do not pay the optimal amount – or what standard models assume - attention to relevant information.

In this thesis, I test for the effects of *limited investor attention* in the context of stock swap merger announcements, using the same measure of *investor distraction* as Hirshleifer, Lim, and Teoh (2009). More specifically, I test whether acquirers exhibit a muted short-term price and volume response to stock swap merger announcements of public and private targets, when there are larger amounts of same-day quarterly earnings announcement releases. Additionally, I test for the *investor inattention* hypothesis presented by Louis and Sun (2010), whether there is a muted short-term market reaction to stock swap mergers that are announced on Fridays.

I find partial evidence for a muted price and volume response in regard to announcements of stock swap mergers that are made on both high-distraction days and Fridays. However, the results are not very robust and consistent across the whole sample and different categories of targets, to warrant strong support for the *investor distraction and inattention* effects, in the context of stock swap merger announcements.

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**Keywords** limited investor attention, investor inattention, investor distraction, stock swap, merger announcements, quarterly earnings announcements

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### Tiivistelmä

*Sijoittajien tarkkaavaisuuden rajallisuutta* ja sen vaikutuksia pääomamarkkinoihin on tutkittu enenevässä määrin viime vuosien aikana. Aiempien tutkimuksien mukaan havaitut viiveellä tapahtuvat markkinareaktiot useisiin yritysten julkistuksiin liittyen, saattavat selittyä sijoittajien alentuneilla tarkkaavaisuustasoilla. Näissä malleissa sijoittajien kognitiiviset resurssit ovat rajalliset, jolloin ulkoisten epäolennaisten ärsykkeiden ja tekijöiden läsnäolo saattaa johtaa tilanteeseen, jossa sijoittajat eivät kiinnitä tarpeeksi – tai standardimallien oletuksien mukaisesti – huomiota relevanttiin informaatioon.

Tässä tutkielmassa testaan *sijoittajien rajallisen tarkkaavaisuuden* vaikutuksia kontekstissa, jossa sulautuminen toteutetaan osakevaihtoa noudattaen. Käytän samaa välillistä mittaria *sijoittajien alentuneen tarkkaavaisuustason* arvioinnissa kuin Hirshleifer, Lim, and Teoh (2009). Tarkalleen ottaen testaan, mikäli osakevaihtosulautumisten julkistuksissa ostajien lyhyen aikavälin hinta- ja volyyminreaktiot ovat hillittyjä, kun samoina päivinä esitetään korkeampi määrä osavuositaisia tulosjulkistuksia. Lisäksi testaan Louis and Sun (2010) esitetyn *sijoittajien tarkkaamattomuuden* hypoteesin mukaan, mikäli markkinareaktio on hillitty, kun osakevaihtosulautumiset julkistetaan perjantaisin.

Löydän osittain näyttöä hillityn hinta- ja volyyminreaktion puolesta, kun osakevaihtosulautumiset julkistetaan perjantaina ja päivinä jolloin osavuositaitosten tulosjulkistusten määrä on korkea. Esittämäni tulokset eivät kuitenkaan ole kovin vahvat ja yhdenmukaiset koko näytteen ja kohteiden eri kategorioiden osalta oikeuttaakseen vahvaan tukeen esitettyjen *sijoittajien tarkkaamattomuuden ja rajallisen tarkkaavaisuuden* vaikutuksista osakevaihtosulautumisten julkistusten yhteydessä.

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**Avainsanat** sijoittajien rajallinen tarkkaavaisuus, sijoittajien tarkkaamattomuus, sulautuminen, osakevaihto, julkistus, tulosjulkistus

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## 1. Introduction

Prior literature implies that *limited investor attention* may explain observed market underreactions to various types of corporate announcements. Some of these announcements include Friday stock-for-stock merger announcements, and earnings surprises on high-distraction days. According to the *investor inattention* hypothesis, lowered investor attention, due to various different circumstances, essentially manifests itself as market underreaction to relevant information. I.e. there is a muted market response. In these models, investor attention is presumed to be a limited cognitive resource. As Louis and Sun (2010) point out, it is important to note, that *investor inattention* does not presume that investors pay no attention at all. As the term *limited investor attention* implies, it assumes that investors pay less attention than is optimal – or standard models assume – in decision making.

Two earlier research papers are of specific interest for my study. First, the one presented by Hirshleifer, Lim, and Teoh (2009), who study how the amount of same day quarterly earnings announcements affect the market response to firms' earnings surprises. Their research covers the time period of 1995-2004. The authors' proposed *investor distraction* hypothesis, assumes that extraneous news inhibits investor attention to relevant news. The proxy for *investor distraction* is the number of same-day quarterly earnings announcements. Days that are in the top and bottom deciles in the daily number of quarterly earnings announcements, are categorized as "high-news days" and "low-news days" respectively. Investors are presumed to get distracted, when a larger amount of quarterly earnings announcements occur on the same day, i.e. "high-news days", high-distraction days.

Second, Louis and Sun (2010), study the price and volume reaction for acquirers that announce stock swap mergers on Fridays, with data spanning from January 1994 to December 2006. According to the presented *investor inattention* hypothesis, reduced investor attention on Fridays, can lead to a muted market response to announcements of stock swap mergers.

In my study, I combine some aspects of both aforementioned research papers. In specific, I use the daily number of quarterly earnings announcements as a proxy for *investor distraction*, as in Hirshleifer, Lim, and Teoh (2009). Days that are in the top and bottom deciles in daily number of quarterly earnings announcements, are categorized as "high-news days" and "low-news days".



While Hirshleifer, Lim, and Teoh (2009) study how a greater number of quarterly earnings announcements, occurring on the same day as firms' earnings surprise announcements, affects the market reactions to these earnings surprises, I alter the setting of the study from earnings surprises to cover stock swap merger announcements, as in Louis and Sun (2010). Thus essentially, I research if a larger number of quarterly earnings announcements occurring on the same day as stock swap merger announcements, affect acquirers' price and volume reactions. I compute acquirers' daily abnormal returns and trading volumes on days -1, 0, +1 and cumulative abnormal returns and abnormal trading volumes over days 0 and +1 around the announcement. All acquirers in my sample are publicly traded companies. Thus, when I refer to acquirers' abnormal returns or trading volumes in the context of my study, the acquirers' public status is implied – which may be obvious, but also worth to mention.

Additionally, I replicate the study of Louis and Sun (2010) for comparative purposes. In both studies, I calculate acquirers' abnormal returns and trading volumes separately, for acquirers that announce stock swap mergers of privately and publicly owned targets. I.e. the sample is divided according to the private/public status of the target.

This aforementioned approach is equivalent to the one used in Louis and Sun (2010), and relates to prior research reporting that returns for acquirers using stock as a medium of payment, are on average, positive (negative), when the target's status is private (public) ((Chang (1998); Fuller, Netter, and Stegemoller (2002); Moeller, Schlingemann, and Stulz (2005); Louis (2005); Gong, Louis, and Sun (2008)). I.e. the market reaction to stock swap announcements, is on average, positive (negative), when the target's status is private (public). Hence, the division of the sample based on whether privately or publicly owned targets are involved is of interest, since the expected market response varies between these two groups. In addition, the results provide better insight of the proposed effects of *investor distraction* and *inattention* across different categories of stock swap mergers.

Overall, merger announcements can be viewed as highly important news to investors. In most cases, it can be expected that investors truly pay an optimal amount of attention to these announcements. Thus, of central interest in my study is, whether *investor distraction* - proxied by the amount of same day quarterly earnings announcements - is at play and has a significant muted effect on acquirers' abnormal trading volumes and returns, even in the context of one of the largest corporate events.

## 1.1 Scope of the study

This thesis includes announcements of stock swap mergers between U.S. companies, from January 1, 1994 to December 31, 2014. All acquirers in my sample are publicly traded companies. As stated earlier, when I speak of the acquirers' abnormal returns or trading volumes in the context of my study, the status of the acquirer is public. The full sample is divided in two, according to the private/public status of the target, to test for the high-news day and Friday differential effects in abnormal returns and trading volumes.

When I test for the high-news day merger announcement differential returns, the control groups consist of low-news days and non-high-news days. Days that are in the bottom decile in the number of quarterly earnings announcements are categorized as low-news days. I have chosen to include the non-high-news days (all observations not classified as high-news days) as an additional control group for further robustness, and to examine whether *investor distraction* – proxied by the daily number of quarterly earnings announcements occurring on the same day as merger announcements – increases linearly. I.e., if the differentials between the high-news days and low-news days are larger than the differentials between the high-news days and non-high-news days. Also, if there is inconsistent variation in the differentials between the high-news days and low-news days/non-high-news days, the proxy for measuring *investor distraction* might not apply very well to this context.

In the case of the Friday effect, the control group consists of non-Friday, i.e. Monday through Thursday. In both tests of high-news day and Friday differential market reactions, the observations for the control groups are obtained from the same whole sample. This makes sense, since the aim is to test for the stock swap merger announcement differential effects in the same announcement context, and not between those of mergers and e.g. cash acquisitions.

This is a short-term event study around the merger announcement window (-1,+1). I calculate differences in abnormal trading volumes and returns separately for all specific days (-1, 0 and +1), as well as cumulative abnormal returns and abnormal trading volumes over the 2-day announcement window, days 0 and +1. I do not compute long-run abnormal returns or trading volumes. Hence, it is also important to note, that when I speak of the acquirers' abnormal returns or trading volumes in the context of my study, it refers to short-term price and volume reactions. Nevertheless, in most cases, I further specify in the text to which specific day(s) I refer to.

## 1.2 Research questions and hypotheses

My research questions are closely related to those presented in Hirshleifer, Lim, and Teoh (2009) as well as Louis and Sun (2010). On a general level, do some specific circumstances lower investor attention – from the optimal level - to relevant news? Leading to possible investor inattention, distraction, and as a result underreaction to relevant corporate announcements. The ex-ante expected end result, is a muted price and volume response to a specific corporate announcement. In this case a merger announcement, where the medium of payment is stock.

The primary research question stands: is there a muted market reaction in regard to acquirers' average abnormal returns and trading volumes, when a stock swap merger is announced on a high-news day (top decile in daily number of quarterly earnings announcements)? The control groups are both low-news days (bottom decile in daily number of quarterly earnings announcements), and non-high-news days (all other days not classified as high-news days).

The ex-ante expectation is that there is, on average, a muted price and volume reaction in regard to stock-for-stock mergers, when they are announced on high-news days, compared to low-news days and all non-high-news days. When the target's status is *private*, the expectation is that the acquirers' abnormal returns on high-news days, are on average, *less positive*. Respectively, when the target's status is *public*, the expectation is that the acquirers' abnormal returns on high-news days, are on average, *less negative*. For both privately and publicly owned targets, the expectation is that the acquirers' abnormal trading volumes on high-news days, are on average, *less positive*. The hypotheses in regard to the *investor distraction* effect on high-news days are presented below.

Differences in abnormal returns:

**H1:** There is a statistically significant *negative* differential between the acquirers' average abnormal returns on high-news days and low-news days/non-high-news days, when the target's status is *private*.

**H2:** There is a statistically significant *positive* differential between the acquirers' average abnormal returns on high-news days and low-news days/non-high-news days, when the target's status is *public*.

Differences in abnormal trading volumes:

**H3:** There is a statistically significant *negative* differential between the acquirers' average abnormal trading volumes on high-news days and low-news days/non-high-news days, when the target's status is *private*.

**H4:** There is a statistically significant *negative* differential between the acquirers' average abnormal trading volumes on high-news days and low-news days/non-high-news days, when the target's status is *public*.

My secondary research question is: is there, on average, a muted market reaction in regard to acquirers' abnormal returns and trading volumes, when a stock swap merger is announced on a Friday? Here, the control group is non-Friday. According to the *investor inattention* hypothesis presented by Louis and Sun (2010), the expectation is that there is, on average, a muted price and volume reaction in regard to stock-for-stock mergers, when they are announced on Friday, compared to other weekdays.

When the target's status is *private*, the expectation is that the acquirers' abnormal returns on Fridays, are on average, *less positive*. Respectively, when the target's status is *public*, the expectation is that the acquirers' abnormal returns on Fridays, are on average, *less negative*. For both privately and publicly owned targets, the expectation is that the acquirers' abnormal trading volumes on high-news days, are on average, *less positive*. The hypotheses in regard to the *investor inattention* effect on Fridays are presented below.

Differences in abnormal returns:

**H5:** There is a statistically significant *negative* differential between the acquirers' average abnormal returns on Fridays and non-Fridays, when the target's status is *private*.

**H6:** There is a statistically significant *positive* differential between the acquirers' average abnormal returns on Fridays and non-Fridays, when the target's status is *public*.

Differences in abnormal trading volumes:

**H7:** There is a statistically significant *negative* differential between the acquirers' average abnormal trading volumes on Fridays and non-Fridays, when the target's status is *private*.

**H8:** There is a statistically significant *negative* differential between the acquirers' average abnormal trading volumes on Fridays and non-Fridays when the target's status is *public*.

### 1.3 Overview of the key results

On the whole, I gain some support for the proposed *investor distraction* hypotheses in regard to the differential abnormal returns and trading volumes between high-news days and low-news days/non-high-news days. However, the results are not very robust and consistent across the whole sample.

**H1:** There is a statistically significant *negative* differential between the acquirers' average abnormal returns on high-news days and low-news days/non-high-news days, when the target's status is *private*.

**H2:** There is a statistically significant *positive* differential between the acquirers' average abnormal returns on high-news days and low-news days/non-high-news days, when the target's status is *public*.

Specifically, for differences in average abnormal returns, I gain support for Hypothesis 1 (at the 5 % and 10 % significance levels), but not for Hypothesis 2. The multivariate regression provides similar results, after controlling for the acquirer's size (market capitalization), book-to-market ratio and the relative size of the transaction (total transaction value/acquirer's market capitalization). However, for Hypothesis 1, most of the effect seems to be attributable to day +1, the following trading day after the merger announcement. The negative differential between high-news days and low-news days on day +1, is the only statistically significant (at the 5 % level) value on the daily level (see Table 6 for further clarification).

**H3:** There is a statistically significant *negative* differential between the acquirers' average abnormal trading volumes on high-news days and low-news days/non-high-news days, when the target's status is *private*.

**H4:** There is a statistically significant *negative* differential between the acquirers' average abnormal trading volumes on high-news days and low-news days/non-high-news days, when the target's status is *public*.

For the differences in average abnormal trading volumes, I gain support for Hypothesis 4, but not for Hypothesis 3. In fact, in regard to Hypothesis 3, the difference in average abnormal trading volumes between the high-news days and non-high-news days is positive, and statistically significant at the 10 % level on day 0. I.e. the effect is opposite to the hypothesized effect.

In respect to Hypothesis 4, my results show statistically significant (at the 5 % and 1 % level) values, for the differences in average cumulative abnormal returns over days 0 and +1. However, it is of concern that the negative differential is larger, when comparing the high-news days and non-high-news days, instead of the high-news days and low-news days. This does not lend strong support for the *investor distraction* effect, since investor attention should be higher – or closer to the optimal level – on low-news days. The multivariate results with control variables, provide similar results as those obtained in the univariate tests for the differentials in abnormal trading volumes over days 0 and +1.

To summarize, for Hypotheses 1 through 4, the statistically significant results I obtain in my univariate tests for the differences in cumulative abnormal returns and abnormal trading volumes over days 0 and +1, are confirmed in the multivariate tests, with the control variables included. Hypotheses 2 and 3 are rejected. Hypotheses 1 and 4 receive partial support. Overall, the results are not consistent and robust enough, to support the hypothesized muted market reaction to stock swap merger announcements that are made on high-news days.

I am able to partially verify the results of Louis and Sun (2010) in regard to the *investor inattention* hypothesis for stock swap mergers announced on Fridays. However, my results are not as robust as theirs. I.e. the magnitudes of the Friday and non-Friday differentials are not as large, statistically significant.

**H5:** There is a statistically significant *negative* differential between the acquirers' average abnormal returns on Fridays and non-Fridays, when the target's status is *private*.

**H6:** There is a statistically significant *positive* differential between the acquirers' average abnormal returns on Fridays and non-Fridays, when the target's status is *public*.

To some degree, I gain support for Hypotheses 5 and 6. The differences in the acquirers' average cumulative abnormal returns over days 0 and +1 are negative and statistically significant at the 1 % level, for Hypothesis 5. Respectively, for Hypothesis 6, the difference is positive and statistically significant at the 10 % level. I show similar results for both in my multivariate tests, with the control variables included.

However, in respect to Hypothesis 5, most of the negative differential is attributable to day +1 after the merger announcement (statistically significant at the 1 % level). The differential on day 0 is negative, and statistically significant at the 10 % level. This suggests that most of the muted market response occurs the following trading day, presumably Monday. For hypothesis

6, the Friday – non-Friday differential value is positive and statistically significant at the 1 % level, on day 0. On day +1, the differential is negative, but not statistically significant. Thus, there might be some reversal in the muted day 0 Friday abnormal trading volumes on day +1, but as mentioned the differential is not significant.

**H7:** There is a statistically significant *negative* differential between the acquirers' average abnormal trading volumes on Fridays and non-Fridays, when target's status is *private*.

**H8:** There is a statistically significant *negative* differential between the acquirers' average abnormal trading volumes on Fridays and non-Fridays, when the target's status is *public*.

In regard to the differences in abnormal trading volumes, my univariate test results provide a positive differential for Hypothesis 7, and a negative differential for Hypothesis 8. Neither of the values are statistically significant when calculating abnormal trading volumes over days 0 and +1. However, after controlling for size, relative size and book-to-market in the multivariate tests, I receive a statistically significant (at the 10 % level) value for Hypothesis 8. Also here, it is of concern that most of the muted trading volume response over days 0 and +1, seems to be attributable to day +1 (statistically significant at the 10 % level). The differential is negative on day 0, but not statistically significant. Thus, the results suggest that most of the muted market reaction in regard to Hypothesis 8 occurs during the following day of the announcement, presumably Monday.

Based on the Friday – non-Friday differential cumulative abnormal returns and abnormal trading volumes I gain support for Hypotheses 5, 6 and 8. Hypothesis 7 is rejected. However, the results are not very robust, and the daily characteristics during day 0 and +1, do not on the whole, lend consistent support for the proposed *investor inattention* hypothesis on Fridays.

#### 1.4 Contribution to the existing literature

The mixed results I receive, for the hypothesized *investor distraction* effect on high-news days, suggest that the daily number of earnings announcements is perhaps not a very good proxy for investor distraction, in the context of stock swap merger announcements. Hirshleifer, Lim, and Teoh (2009) use the proxy in the context of earnings surprises, and show statistically significant and robust results.

However, earnings announcements and surprises differ from merger announcements, in that they are to a higher degree anticipated news. Thus, our results are not directly comparable. Perhaps merger announcements are themselves such attention grabbing news that a large amount of earnings announcements occurring on the same days, do not warrant consistent results of a muted market reaction across transactions including private and public targets.

My results also provide some indication to the opposite effect of limited investor attention. In some cases, the differentials are lower between the high-news days and low-news days, compared to the high-news days and non-high-news days. Thus, limited investor attention might not increase linearly, at least with a higher daily number of earnings announcements.

At the least, to gain further insight to the *investor distraction* effect in the context of merger announcements and high-news days, other control variables should be included. E.g. multiple earnings surprises occurring on the same day, can be expected to have a larger distraction effect, than that of “normal” earnings announcements. Also, when several mergers and acquisitions are announced on the same day, it can be expected to increase investor distraction. Especially, if there are large “attention grabbing” announcements that receive the lion’s share of that day’s media coverage. The high-news/low-news status of the day following the merger announcement would also be of interest, since it could help explain some of the patterns I observe in regard to differentials in abnormal returns and trading volumes. I have not controlled for these above mentioned variables. Thus, I cannot elaborate on their possible effects. To contribute to the existing literature, to a higher degree, long-run abnormal returns and trading volumes should also be calculated, along with the short-run event window calculations. This would provide a wider perspective to the hypothesized effects.

According to the results of Louis and Sun (2010) the muted Friday effect seems larger for smaller acquirers. My results are somewhat consistent to theirs in regard to acquirers’ differential cumulative abnormal returns when the target’s status is private/public, and abnormal trading volumes when the target’s status is public. However, as DellaVigna and Pollet (2009) report, if the muted price response on Fridays is attributable to *investor distraction*, trading volumes should also be affected. Thus, the inconsistency of my results does not lend strong support for the *investor inattention* hypothesis, of a muted market response to the corporate announcements made on Fridays (however, see next Section 1.5 for limitations of the study).



The results I report for the Friday *investor inattention* hypothesis, raises some questions about the robustness of the results reported by Louis and Sun (2010). A new forthcoming paper by Michaely, Rubin, and Vedrashko (2015, forthcoming) suggests that prior reported findings of the muted market reaction on Fridays, to various corporate announcements, including merger announcements, are due to selection bias. The authors find that firms conducting Friday announcements have experienced muted announcement effects on other weekdays also. These firms seem to share common unobserved characteristics. After controlling for the shared characteristics, the authors find no support for the *investor inattention* effect on Fridays. If the results of Michaely, Rubin, and Vedrashko (2015, forthcoming) hold, this could explain some of the differences between my results and those of Louis and Sun (2010).

### 1.5 Limitations of the study

The main limitation of this thesis is that my sample only includes firms, acquirers with CRSP (The Center for Research in Security Prices) share codes 10.<sup>1</sup> The first digit “1” refers to ordinary common shares. The second digit “0” stands for “securities which have not been further defined”. Observations with CRSP share codes 11 are omitted, which reduces my sample size. These are ordinary common shares, “securities which need not be further defined” (see the footnote for the exact CRSP descriptions). Thus, for my hypothesized *investor distraction* effect on high-news days, a possible limitation is that my sample size is not large enough. Also, as earlier mentioned, including additional control variables should be considered to gain further insight on the hypothesized effects.

The omission of CRSP share codes 11 is also the likely reason to why I am not able to fully replicate the results of Louis and Sun (2010). I.e., verify their results for the Friday *investor inattention* phenomenon causing a muted market reaction, statistically significant in both abnormal trading volumes and returns, and for stock swap acquisitions of public and private targets. The sample of Louis and Sun (2010) includes 3 995 stock swap announcements, while my sample contains 2 833 observations, with an 8 year longer time period. It has to be noted though, that for the most part, I report effects that are in the same direction as their results, but

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<sup>1</sup> [http://www.crsp.com/files/data\\_descriptions\\_guide\\_0.pdf](http://www.crsp.com/files/data_descriptions_guide_0.pdf) (See page 79).

the magnitude differs. In short, I do not receive as robust results as Louis and Sun (2010), for the proposed muted market response on Fridays.

Including CRSP share codes 11 would likely warrant more robust results in regard to the Friday muted market reaction effect, since my sample would to a larger degree include the same observations that Louis and Sun's (2010) sample contains. This is due to the earlier years in my sample being heavily favored in the number of merger announcements (see Appendix 1). Louis and Sun (2010) data covers the time period of 1994-2006. In my sample, the number of merger announcements during the 2007-2014 time period amount to 337 in total, compared to 2 496 during the time period 1994-2006 (see Appendixes 2 and 3). The yearly distribution – 2007 to 2014 - of merger announcements with CRSP share code 11 acquirers included, would have to differ substantially from the one I show for CRSP share codes 10 to warrant opposite expectations to the results that Louis and Sun (2010) report. However, it is not likely that the overall decreasing trend of stock swap merger announcements after the 1998-2002 time period would significantly be altered, when including observations with CRSP share codes 11.

The differences in our results also raise some interesting questions. First, are the excluded observations in my sample driving the results that Louis and Sun (2010) report? Second, are their results robust enough and do they hold for a subsample of theirs? Third, are some unobserved variables driving the differences in our results? My sample for Friday stock swap merger announcements is essentially a subsample of theirs. Thus, the ex-ante expectation is that I receive similar results. Another possibility is that the Friday muted market reaction effect in regard to stock swap merger announcements, is not present after the 2006 time period. As earlier mentioned, the results reported by Michaely, Rubin, and Vedrashko (2015, forthcoming), can also mean that selection bias is driving my results, when the Friday differential market reaction is considered.

## 1.6 Structure of the paper

The paper proceeds as follows. In Section 2, I present the findings of prior literature related to my topic of study. Section 3 covers the selection of the data and stock swap merger announcement sample. Section 4 demonstrates the methods used to calculate the abnormal returns and trading volumes. In Section 5, I present the empirical findings of my study, along with descriptive statistics of the sample. Section 6 provides further discussion of results and the

implications of my empirical findings. Section 7 offers a summary and suggestions for further research.

## 2. Prior literature

This section covers relevant topics of prior literature, connected to my thesis topic of limited investor attention. First, I provide some general notions about behavioral finance and investor attention, after which I present a more in-depth analysis of related prior literature.

### 2.1 Behavioral finance and investor attention

The topic of limited investor attention falls under the broader category of behavioral finance, which seeks to combine a wider array of social science perspectives – including psychology and sociology – with conventional economics to provide explanations for why people make irrational financial decisions. Departures from rationality and classical assumptions emerge both in beliefs, judgments and choices, preferences. DellaVigna (2007) defines it, as deviations in nonstandard preferences, nonstandard beliefs, and nonstandard decision making. These departures are of interest, because they help explain why and how markets might be inefficient.

Behavioral aspects have been taken into consideration for quite a while in economics and finance research, e.g. Bernoulli (1738). But as a true approach and established field, it slowly started gaining momentum since the 1970s, or as Thaler (2015) titles it, “Beginnings”. Since the early 1990s the field has become a more prominent force in finance and economics. A current example of this is The Behavioral Insights Team (BIT), a UK government institution, which aims to redesign and improve public services through the application of behavioral sciences.<sup>2</sup>

Herbert Simon coined the term “bounded rationality” in the 1950s and was among the earliest critics of the idea that people have unlimited information processing capabilities. The concept of bounded rationality, which maintains that decision makers’ rationality deviates from classical assumptions in having to work under three constraints: limited information, cognitive limitations in evaluating and processing available information, and limited amount of time. Rather than maximizing their benefit from a particular course of action, decision makers are bound to make “satisficing” or “good enough” choices in complex situations. Although Simon’s

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<sup>2</sup> <http://www.behaviouralinsights.co.uk/>

work has been criticized for not providing enough specifics, it laid out some important groundwork for future studies in behavioral economics and finance. It links directly to my study, as individuals' limited cognitive resources can cause limited investor attention to relevant information and further lead to market inefficiencies.

Some of the most important facilitators of behavioral economics include psychologists Daniel Kahneman and Amos Tversky – famous for their work on the psychology of decision making and judgment. A pinnacle of their contributions to behavioral finance is the prospect theory (Kahneman and Tversky (1979)). Contrary to the standard expected utility theory, prospect theory focuses on changes in wealth rather than levels of wealth. Utility is modeled in terms of gains and losses from a reference level. According to the model the value function is steeper for losses than for gains and losses hurt approximately twice as much as similar gains satisfy. Also, the framing of choices has an effect on individuals' preferences. The framing of information and choices applies to investor attention as well.

For example, Hossain and Morgan (2006) document that variations in minimum bids, shipping and handling costs of same item eBay auctions, lead to significant differences in final selling prices. Items with lower minimum bids, but higher shipping and handling costs, have yielded significantly higher selling prices – although the initial total minimum cost is the same. In strongly efficient markets, investors should only care about the final total price. Investors seem to treat different components of price with separate mental accounts and show signs of loss-aversion in bidding behavior.<sup>3</sup> For example, when (the shipping and handling cost) reference level is not excessive and is set at \$3.99, a minimum bid of \$0.01 is not as large a deviation from the reference level, as would be the case vice versa. Odean, and Zheng (2005) report similar findings for mutual fund load fees. Investors seem to be more sensitive to salient “in-your-face” front-end load fees and commissions, compared to operating expenses that incorporate these fees.

Development of models such as the prospect theory have been important, since they provide better frameworks for understanding behavioral anomalies and market inefficiencies. Over the years, there have been numerous reported and observed market anomalies and inefficiencies that standard economic models have not been able to explain. One example of the clearest violations to standard economic theory is the case of Palm and 3Com, documented in (Lamont and Thaler 2001).

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<sup>3</sup> For mental accounting see Thaler (1985); Thaler (2015).

In the end though, behavioral economics does not aim to eradicate conventional economics, but rather build on it and provide improved models to account for the observed evidence based economics of humans. After all, the efficient markets based statistical models are primarily used to measure for variations in average cross-sectional returns. For example, the Fama-French Three Factor Model (Fama and French (1992, 1993)) explains a substantial part of variations in diversified portfolio returns. Behavioral economics and finance have also not been able to produce a unified theory that is directly rejectable (see e.g. Fama (1998)).

However, Thaler (2015) puts it quite well, that the once supposedly irrelevant factors (SIFs), such as cognitive biases, heuristics in judgment and decision making, and other behavioral factors of humans have begun to matter a great deal. Limited investor attention is among these. There are numerous reasons that might cause reduced investor attention to e.g. corporate announcements and new information. One example is simply distraction, as investors are daily faced with a myriad amount of information from various different sources.

Most investors likely try to direct their focus towards the most relevant information to aid in decision making.<sup>4</sup> However, they often still need to assess and go through some irrelevant, unnecessary information, to filter out the relevant information. Experience may be of help, but it does not provide an all-encompassing solution. Information processing requires effort and attention, both of which are finite resources. Thus, as long as we remain humans, systematic biases such as limited investor attention can be expected to persist. If and how they affect market efficiency is a logical step that follows.

In finance and economic research papers, the terms *investor inattention* hypothesis and *investor distraction* hypothesis are used to describe similar phenomena. *Investor inattention* and *limited investor attention* likewise. As Louis and Sun (2010) point out, investor inattention does not presume that investors pay no attention at all. Rather, it assumes that investors pay less attention than is optimal – or standard models assume – in decision making. This may happen, due to e.g. facing a high load of information, or various other factors. From an efficient market perspective, this can lead to an irrational delayed reaction, underreaction by investors to various external relevant stimuli.

Investor attention also plays a dual role (Hou, Peng, and Xiong (2009)). On the one hand, limited investor attention can cause market underreactions. On the other hand, market overreactions require a sufficient level of investor attention to occur. Based on existing theories,

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<sup>4</sup> Although, attention grabbing distractive news headlines can be quite persuasive.

market overreactions are typically attributable to investors' information processing biases, such as extrapolative expectations and overconfidence (Hou, Peng, and Xiong (2009)). These are documented in De Long et al. (1990), and Daniel, Hirshleifer, and Subrahmanyam (1998).

Limited investor attention is most likely very hard to directly measure. Thus, various proxies need to be used to measure for its proposed effects. The proxies do not provide a 100 percent correlation with the root cause. However, they provide a good start, if they are carefully selected. Hence, an important part in assessing the literature on limited investor attention, is considering the validity of the selected proxies. In other words, how well they explain a certain effect.

For example, let us consider the Friday effect in Louis and Sun (2010). One could e.g. hypothesize that employees are less productive during certain weekdays. A proxy for inattention would be to devise a questionnaire, asking employees how much they think about the weekend and non-work related issues during different weekdays and working hours. As this is a highly subjective, qualitative measure, it would be hard to standardize and correctly measure. Just as it would be, when asking people how discomfoting a visit to the dentist's office was. This could then be measured against some selected metric of individual employee performance. As there are numerous different ways to measure employee performance, the selection of criteria also becomes important.

As a branch of science, finance is in a good position, since there is ample standardized data available. For example, trading volumes and daily stock returns. The effects of various systematic biases can quite accurately be measured on a large scale. Although, this quite often works in reverse. A market anomaly, inefficiency is discovered, to which researchers subsequently try to provide an explanation(s).

Several prior studies have documented irrational underreaction, delayed reaction by investors connected to various types of corporate decisions and events.<sup>5</sup> As Hirshleifer, Lim, and Teoh (2009, p. 2289) note, "there is on average a delayed price reaction to news that has the same sign as the immediate response". During recent years, and in several of the most important prior research papers related to my study, limited investor attention has been proposed as an explanation for the observed market anomalies. Behavioral finance has indeed greatly benefited

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<sup>5</sup> Bernard and Thomas (1989); Jegadeesh and Titman (1993); Loughran and Ritter (1995); Ikenberry, Lakonishok, and Vermaelen (1995); Desai and Jain (1997), Dichev and Piotroski (2001); Hirshleifer, Lim, and Teoh (2009). For a more comprehensive listing, see Hirshleifer, Lim, and Teoh (2009).

from the work of other social scientists - including psychologists and sociologists – in trying to provide explanations for observed market anomalies. Ample financial data has also provided a setting to test for the proposed and often highly experimental hypotheses on a mass scale. Thus, behavioral finance works very much in tandem with other social sciences.

Various different proxies have been used to measure investor inattention. These include amongst others, low trading volume, down market periods, event-occurrence during non-trading hours, Fridays and daily number of earnings announcements (Hirshleifer, Lim, and Teoh (2009)). I will now go through some of the most relevant research that have been carried out related to my study. The first part comprises studies related to the observed phenomena of delayed market reactions, market underreactions, and efficient markets. The second part consists of more recent literature that proposes limited investor attention, as a possible explanation for the observed anomalies related to underreaction.

## 2.2 Equity issues and repurchases

Loughran and Ritter (1995) find that firms conducting an IPO or an SEO, have underperformed in the long-run, 5-year period, compared to non-issuing companies of the same sizes. Their study covers the time period of 1970 to 1990. The authors adjust for both size and book-to-market ratios, which do not significantly explain the results. Nor does long-term return reversals or differences in betas explain the underperformance of firms conducting SEOs. According to the authors, a possible explanation for the effects, is that firms take advantage of conditions by issuing equity when it is overvalued. Previous studies have documented, that the post-issue operating performance of issuing firms, did not justify the valuations at the time of the IPOs (e.g., Jain and Kini (1994); Mikkelson and Shah (1994)).

However, the part that is most relevant for my study, is connected more closely to the delay in underperformance of issuing firms. In the presented results, the underperformance of issuing firms starts subsequent to the 6-month period after the IPO or SEO (Loughran and Ritter (1995)). Investors seem to overweight issuing firms' recent performance and underweight long-term mean-reverting tendencies. There is a delayed market reaction, and it seems to take a while for investors to respond, to issuing firms' misvaluations at the time of the equity issue, given the levels of subsequent operating performance, cash flows.



Ikenberry, Lakonishok, and Vermaelen (1995) study the long-run stock performance of firms announcing share repurchases, during the time period 1980-1990. Their study is motivated by managers often stating that they are repurchasing shares due to undervaluation of the stock or it being a “good investment” – which indirectly states the same, if managers value positive returns as positive. This seems intuitive. After all, firms tend to announce equity issues, when they perceive it as being overvalued (Loughran and Ritter (1995)). The authors use a four year buy-and-hold strategy to measure potential abnormal performance.

According to the Ikenberry, Lakonishok, and Vermaelen (1995), the average market reaction to open market share repurchase announcements is 3.5 %. Using the four year buy-and-hold strategy they report average positive abnormal returns of 12.1 % for the announcers. Combining announcement and long-run returns provides an undervaluation of approx. 15 %. In other words, there is post-announcement drift. Size and book-to-market effects are controlled for. In the case of value stocks (top book-to-market quantile), the average long-term abnormal return is 45.3 %. As per the authors, these high book-to-market companies announcing share repurchases seem to be truly “out-of-favor”, and exhibit higher performance compared to high book-to-market stocks in general. The reasoning here is that these high book-to-market firms, are more likely to be driven by undervaluation to conduct stock buybacks.

This relates to the study of Lakonishok, Shleifer, and Vishny (1994), who evaluate that value strategies have outperformed the market, due to irrational behavior of investors, rather than value strategies being fundamentally riskier. I.e. their long-term higher performance is not attributable to compensation for being fundamentally riskier. Value stocks are “out-of-favor”, as investors flock to glamour stocks with recent high growth rates, e.g. earnings, cash flow. (Lakonishok, Shleifer, and Vishny (1994)). As per the authors, growth rates are mean-reverting, and investors have consistently during the 1968-1990 period seemed to overestimate future growth rates of glamour firms’ financials. They have also overreacted to stocks performing very badly, causing these stocks to get underpriced. Contrarian investors then bet against these “naïve investors”, buying the underpriced shares. Hence, not all high book-to-market stocks are truly “out-of-favor”.

In light of their results, Ikenberry, Lakonishok, and Vermaelen (1995) raise questions over the appropriateness of evaluation the economic impact of corporate decisions, by measuring short-term abnormal performance. This relates more closely to evaluating the whole market efficiency hypothesis, and I will go through it more thoroughly later on, when assessing the

paper presented by Fama (1998). In my study, I am not measuring post-event long-run abnormal returns, but rather focus on short-term abnormal returns around the event date (-1, +1). However, the observed long-term market underreaction phenomenon is of interest, since it implies that investors fail to fully adjust for new information even after the short-term event window.

### 2.3 Post-earnings announcements drift (earnings momentum)

Ball and Brown (1968) were the first to document the post-earnings announcement drift phenomenon, i.e. that there is a delayed price reaction to earnings news. This applies for both positive and negative earnings news, and more specifically to unexpected earnings surprises. Their sample covers the time period of 1946 to 1966. The term earnings momentum, is used to describe the same phenomenon. The results of Ball and Brown have subsequently been confirmed in several other studies, see e.g. Watts (1978); Latane and Jones (1979); Bidwell and Riddle (1981); Rendleman, Jones, and Latane (1982); Foster, Olsen, and Shevlin (1984)). Based on the post-earnings announcement drift, a long (short) position in the highest (lowest) decile in stocks of companies announcing earnings surprises, has also been documented to yield substantial abnormal returns (Foster, Olsen, and Shevlin (1984); Hirshleifer, Lim, and Teoh (2009)).

According to Reinganum (1981), the observed post-earnings announcement abnormal returns following earnings news, can be explained by shortcomings – omission of risk factors - in the one-period capital asset pricing model (CAPM), rather than market inefficiency. The omitted variables seem to be more closely related to firm size.

Foster, Olsen, and Shevlin (1984) study the same phenomenon with data spanning from 1974 to 1981, and find evidence of post-earnings announcement drift for a subset of earnings expectation models. According to the authors, some 80 percent of the differential abnormal returns during days +1 to +61 after the announcement, between high and low earning surprise portfolios, is explained by the sign and magnitude of the earnings surprises. In the authors' words, "the more positive (negative) the unexpected earnings change, the more positive (negative) the post-announcement abnormal returns" (Foster, Olsen, and Shevlin (1984, p. 598)). Firm size is reported to explain a substantial portion, 65 %, of the difference in abnormal returns between the highest and lowest decile of earnings surprise portfolios.

Bernard and Thomas (1989) build on the earlier work, with data from 1974 to 1986, trying to discriminate whether post-earnings announcement abnormal returns are explained, by a delayed price response to new information/earnings reports, or a failure to adjust returns fully for risk (CAPM misspecification). The authors present two possibilities for the delayed price reaction, transaction costs and investors who fail to fully incorporate the effects of the new information to their future estimates. They find little support for the explanation of incomplete risk adjustment. This is consistent with the later finding of Chan, Jegadeesh, and Lakonishok (1996). However, their findings are consistent with the explanation of a delayed price reaction to new information. In Bernard and Thomas (1990), the same authors' findings support the notion that investors fail to adjust current earnings information for future earnings expectations. I.e. investors fail to fully account for new information.

Some alternative explanations have been proposed, although the delayed price reaction theory has continued to gain support. See, e.g. Jegadeesh and Titman (1993); Chan, Jegadeesh, and Lakonishok (1996)). In more recent studies, limited investor attention has also been proposed as an explanation (for example, (Hirshleifer, Lim, and Teoh (2009)).

## 2.4 Price momentum

Jegadeesh and Titman (1993) study strategies of buying (selling) companies that have performed well (poorly) in the past, over the time period 1965-1989. Essentially, they are studying the price momentum effect. They find that a portfolio buying past winners and selling past losers creates significant abnormal returns over 3-12 month holding periods. These abnormal returns do seem to partly reverse in the long-run however, as half of the excess returns dissipate in the two years following the initial 3-12 month period after portfolio formation.

The results suggest that information diffuses gradually, and investors are slow to adjust their valuations in the short-term, although the authors think attributing it as evidence of underreaction is likely too simplistic. Nonetheless, they mention that “the evidence is, however, consistent with delayed price reactions to firm-specific information” (Jegadeesh and Titman (1993 p. 67)). The authors present some theories that could help explain the results of short-term positive performance and long-term return reversals. According to the Jegadeesh and Titman (1993), one explanation is that “positive feedback traders” temporarily shift prices away

from their fundamental values and cause the market to overreact in the short-term – which subsequently reverses in the long-term (documented in De Long, Shleifer, and Summers (1990)). Jegadeesh and Titman (1993) present an alternative hypothesis, whereby investors underreact to information about companies' short-run expectations, but overreact to information about their long-run expectations. This provides an explanation to short-term price momentum, but not explicitly to long-term return reversals, as prices would need to continue to climb. According to the authors, the initial underreaction and subsequent overreaction can occur, due to the difference in nature of information that is available to investors to evaluate firms' short-term and long-term prospects. For example, earnings forecasts vs. more ambiguous information used in long-term valuation (presumably, such as the outlook for a specific sector or industry, and investor sentiment towards managers' capabilities). For this to occur, investors partly need to assess long-term information irrationally, e.g. relying on gut feeling and subjective information.

Chan, Jegadeesh, and Lakonishok (1996) provide some additional input, on the observed abnormal returns, achieved through price and earnings momentum strategies, with data spanning from 1977 to 1993. Their results suggest that investors underreact to new information in both cases, leading to predictability of future returns from past returns. After controlling for market risk, size and book-to-market factors, their results are still robust. According to the authors, the results still hold whether standardized unexpected earnings (SUE), abnormal returns around earnings announcements, or revisions in analysts' forecasts of earnings are used to measure earnings surprise. Also, price momentum seems to be larger and last longer than the effect of earnings momentum, and drifts seem to be the largest for the stocks that exhibit previous poor earnings performance (Chan, Jegadeesh, and Lakonishok (1996)). Since there does not seem to be subsequent reversal in the drifts, the authors do not fully support the notion of positive feedback trading causing the effects. Rather, to a larger part delayed investor response to new information.

Desai and Jain (1997) study the long-run (1-3 years) stock returns following announcements of stock splits and reverse splits, during the 1976-1991 period. For both stock splits and reverse splits, 1- and 3-year buy-and-hold strategies produce significant abnormal returns after the announcement month. These amount to 7.05 % and 11.87 % for stock splits, -10.76 % and -33.90 % for reverse splits. The observed announcement month abnormal returns are 7.11 % for stock splits, and -4.59 % for reverse splits. According to the authors, the positive and negative

drifts suggest that the market underreacts to both split announcements, i.e. to firm-specific news. This is in line with Jegadeesh and Titman (1993). Additionally, both company size and book-to-market criteria seem to partly explain the observed abnormal returns. For stock splits, small firm 3-year abnormal returns are significantly higher compared to large firms, 46.87 % and 2.15 % respectively. Glamour stocks also seem to outperform value stocks, with 1-year abnormal returns of 8.73 % compared to 0.40 % (Desai and Jain (1997)).

Dichev and Piotroski (2001) report similar findings of market underreaction to Moody's bond rating downgrades, during the time period of 1970-1997. In the first year after being downgraded, these companies' stocks show negative abnormal returns of -10 to -14 %. Additionally, a substantial portion of the abnormal returns is attributable to subsequent earnings announcements after the downgrade. The effect is also stronger for low credit-quality, small firms. Bond rating upgrades do not show similar results. Lower systematic risk does not seem to explain the results, as downgrades underperform during most of the sample period.

The notion that negative abnormal returns are more pronounced compared to positive abnormal returns, is consistent with Bernard and Thomas (1989), who find that the post-earnings announcement drift phenomenon is stronger for negative earnings surprises. Michaely, Thaler, and Womack (1995) report similar findings for dividend cuts and omissions compared to dividend increases and initiations.

## 2.5 Market efficiency hypothesis

Perhaps the most compelling arguments, for the market efficiency hypothesis come from Fama (1998). It is important to note, that this paper addresses the literature up to the year of publication, 1998. The author questions, whether various reported long-term return anomalies truly represent market inefficiencies, or just chance results consistent with the efficient markets theory.<sup>6</sup> For example, under efficient markets - where available information is fully reflected in prices - overreactions are as common as underreactions. The same applies for post-event return continuation and post-event return reversal. The author goes through an array of finance literature, for which the scope of my study is not sufficient. However, the main arguments for

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<sup>6</sup> In Fama (1998), there is an informative table (Table 1 in the document) of the signs of long-run pre-event, announcement, and long-run post-event returns, reported in prior event studies.

the market efficiency theory rely on a set of core arguments that concern several of the studies and findings being presented here.

First, according to Fama (1998), when the results of behavioral finance literature are viewed as a whole, reported underreaction and overreaction anomalies seem to be roughly evenly distributed. I.e. the hypothesized underreaction-driven anomalies are roughly as common as the hypothesized overreaction-driven anomalies. However, the author adds that if long-run abnormal returns are so large that they cannot be attributed to chance, this poses a problem for the efficient markets theory.

Second, long-term abnormal return anomalies seem to be sensitive to methodology – contrary to short-term event studies, where daily expected returns are close to zero. According to Fama (1998), reasonable changes in methodology and/or statistical approaches, produces insignificant results. I.e. the anomalies are significantly reduced or disappear. Thus, as per the author, the results of different studies, can reasonably be attributed to chance, even when inspected one at a time. The author also questions the use of buy-and-hold abnormal returns (BHARs), in favor of sums or averages of short-term abnormal returns (CARs, AARs). Reviewing the literature, Fama (1998) notes that different models' difficulties in explaining abnormal returns of small stocks may be, due to bad-model problems.

Third, the specific models used to predict patterns in one context, do not seem to explain very well the patterns observed in regard to other anomalies. For example, those that predict long-run return reversals of pre-event abnormal returns, do not fare well in events that are characterized by long-run return continuation. I.e. the prediction of one specific model, is not the observed norm. The author mentions some examples, of which one is the model presented by Barberis, Shleifer, and Vishny (1998). The model seems to fit to the reported results in Loughran and Ritter (1995), but not Desai and Jain (1997).<sup>7</sup>

Fourth, the behavioral finance literature has not focused enough on creating an alternative hypothesis – that is rejectable - for market efficiency, but rather drawing conclusions that markets are in some aspects inefficient, due to the observed anomalies. (Fama (1998)). I.e., as mentioned earlier, a problem in regard to behavioral finance is the lack of a unified theory that explains a major part of the reported anomalies, market inefficiencies.

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<sup>7</sup> For a more comprehensive list, see Fama (1998).

In Fama (1998) there is an interesting notion related to this study. When using value-weighted returns, rather than equally weighted returns, post-event long-run abnormal returns often decrease or disappear. Bad-model problems seem to be more pronounced in the case of using equally weighted returns, although this is discussed in the context of long-run returns, which I do not measure. Concluding, the author notes that the post-earnings announcement drift phenomenon, documented in Ball and Brown (1968) and Bernard and Thomas (1990), as well as price momentum, documented in Jegadeesh and Titman (1993), are among the reported anomalies that survive the robustness checks.

Rau and Vermaelen (1998) confirm that conflicting results in long-term event studies of similar topics can be due to the results being sensitive to the models used for calculating expected returns. However, the authors also comment that short-term event studies do not seem to capture the full effects of the market reaction to corporate events. Some events have been mentioned above, for example IPOs and SEOs, proxy contests.

There have been numerous counterarguments made to the arguments presented in Fama (1998), but listing them all is beyond the scope of this study. Also, the paper of Fama (1998) mainly presents arguments, as to why the market efficiency hypothesis survives the test of reported long-run anomalies. This is not at the center of my study, although they are of overall interest. One example is Daniel, Hirshleifer, and Subrahmanyam (1998), who do not believe that the reported underreaction and overreaction driven anomalies are attributable to chance, but show strong and regular return patterns. According to the authors, the size, book-to-market and momentum effects persist across different time periods and internationally. Also, most of the reported anomalies exhibit a pattern, where average post-event stock returns are of the same sign as public event-date average stock returns (Daniel, Hirshleifer, and Subrahmanyam (1998)).

## 2.6 Earnings announcements and limited investor attention

Hirshleifer, Lim, and Teoh (2009) find a muted immediate and higher delayed market reaction (post-earnings announcement drift) to a firm's earnings surprise, when there is a greater amount of same day earnings announcements made by other firms. In short, extraneous news appear to cause market underreaction – presumably attributable to investor attention - to relevant news. The authors find statistically significant evidence for both abnormal returns and trading

volumes. The proxy of same-day earnings announcements seems applicable, as it directly measures the information load faced by investors. It is thus assumed, that investors possess limited cognitive resources.

There is an important distinctive feature between this and some other research papers on limited investor attention.<sup>8</sup> The authors express it quite well, “the prior empirical literature on investor attention has primarily focused on the neglect of public information signals, on the effects of conditions (market return, volume, time-of-day, day of week) that proxy for lower investor attention, and on how greater publicity draws attention to the firm” (Hirshleifer, Lim, and Teoh (2009, p. 2292). Rather than testing for what other calls on limited cognitive resources hinder the appropriate response to new information, their method tests directly whether distractive signals draw attention away from relevant signals.

This is also a feature in my study, as I test whether a greater amount of same day earnings announcements draw attention away from merger announcements. I also test for the Friday effect, but as stated, this is connected to effects of conditions. In the case of e.g. Friday, investor attention can be lower, due to wrapping up business for the week and the upcoming weekend. Different weekends most likely differ in importance to various investors, but there is only one weekend – namely two days - between Friday and Monday. The level remains unaltered. The number of earnings announcements can widely differ between separate days. Hence, the two methods of testing for limited investor attention do indeed differ.

Hou, Peng, and Xiong (2009) test for the hypothesis of investor attention playing a dual role in explaining both earnings and price momentum. The authors findings suggest that earnings momentum (price momentum) weakens (strengthens) with investor attention. Limited investor attention is provided as an explanation for the price underreaction to earnings announcements.

According to their hypotheses, low volume stocks are expected to be more prone to the earnings momentum effect, presumably due to investors paying less attention to these stocks. Contrary, high volume stocks are expected to be more prone to the price momentum effect, driven by overreaction. The authors find evidence for both. Also, earnings momentum profits are found to be higher in down markets, and price momentum profits higher in up markets (Hou, Peng, and Xiong (2009)). This is supported by Karlsson, Loewenstein, and Seppi (2009), who report

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<sup>8</sup> See e.g. Francis, Pagach, and Stephan (1992); Bagnoli, Clement, and Watts (2005); DellaVigna and Pollet (2009); Hou, Peng, and Xiong (2009); Hirshleifer, Lim, and Teoh (2009); Louis and Sun (2010). For a more comprehensive list, see Hirshleifer, Lim, and Teoh (2009).



of an “ostrich effect”, whereby investors pay more attention to their portfolios in rising markets than when markets are flat or falling. In the long-run, there seems to be a reversal in price momentum returns, but not in earnings momentum returns (Hou, Peng, and Xiong (2009)). This applies for months 13-36 after portfolio formation. The latter finding somewhat contradicts that of Jegadeesh and Titman (1993), who report that achieved abnormal earnings momentum profits for the first year after portfolio formation of past winners and losers partly dissipate in the two following years. In short, they document a partial long-term reversal. Both authors observe similar results for the long-term reversal of price momentum profits.

For my thesis the long-run reversal of earnings momentum profits – or lack of it – is not a central issue, since I concentrate on measuring abnormal returns around the announcement date. This is however an interesting aspect of the phenomenon. Hirshleifer, Lim, and Teoh (2009, p. 2309) observe that “the difference in drift between high-distraction and low-distraction days declines over longer horizons, and becomes small and insignificant by 90 days after the earnings announcement”. They do not test for a possible long-run reversal. Their results rather indicate that the difference in drift becomes insignificant in the longer run, as investors become more informed. Limited investor attention, investor distraction is implicated as providing an explanation for market underreaction, when investors are faced with a high amount of irrelevant news.

Hou, Peng, and Xiong (2009) use trading volume as a proxy for attention in their cross-sectional analysis. This seems applicable, given their explanation that active trading is assumed to require investors’ attention, and referral to prior established research. See, e.g. Odean (1998); Sheinkman and Xiong (2003). In short, in order to trade a stock, investors need to pay attention to it. In the authors’ words, “when they pay less attention to a stock, they are less likely to trade it; and when they pay more attention to a stock, behavioral biases such as overconfidence can give rise to heterogeneous opinions among investors about the stock, thus generating more trading”. Hou, Peng, and Xiong (2009, p. 2)

Hirshleifer, Lim, and Teoh (2009) find some evidence – significant at the 5 % level - that the investor distraction effect on announcement date cumulative abnormal returns over days 0 and +1, is lower for larger firms. In other words, the investor inattention phenomenon seems to be higher for small companies. Investor distraction also seems to be stronger for positive earnings surprises, compared to negative earnings surprises.

The above mentioned observations carry some implications for my research. I am not directly studying the effect of limited investor attention on earnings announcements surprises. However, a merger announcement can be viewed as a surprising event for investors - assuming that information about the merger is not to a significant degree leaked in advance. Thus, limited investor attention should be more pronounced in the case of smaller announcing companies. This is supported by the stronger earnings momentum effect for low volume stocks. Low volume stocks are typically those of smaller companies with less market liquidity. According to the “ostrich effect”, investor inattention should also increase in flat or falling markets. Lastly, positively surprising merger announcements can be hypothesized to exhibit stronger effects of limited investor attention.

## 2.7 Events occurring when markets are closed and down market periods

Francis, Pagach, and Stephan (1992) study the price and volume reactions to earnings announcements, made during non-trading hours. Specifically, they compare the market reaction between earnings news released during trading and non-trading hours, and by the same firms' during consecutive years. The focus is on the price and volume reactions, when the stock exchange (NYSE) opens the following trading day, after an “overnight” announcement. The reasoning is that this is the first opportunity for investors to act on the information released during non-trading hours.

The authors do not find support for a significant differential opening market reaction during the following trading day, based on the prior released non-trading hour information. This does not seem to occur, due to the following days' opening price setting process, the nature of the news released during non-trading hours, or the requirement that specialists maintain orderly price sequences (Francis, Pagach, and Stephan (1992)). By issuing a buy or sell order before the NYSE opens, based on the sign of the forecast error (Value Line), the strategy yields abnormal returns of 1.4 % during the two days after the opening of the exchange. However, Francis, Pagach, and Stephan (1992) note that net of transaction costs, the approach seems to be unprofitable.

With earnings announcement data spanning from 2000 to 2003, Bagnoli, Clement, and Watts (2005) weigh in on the discussion. According to the authors, the removal of information dissemination barriers in the 1990s, has changed the distribution of firms' quarterly earnings

announcements across trading and non-trading hours. Over the time period of 2000-2003, most of the quarterly earnings announcements seem to be released outside of regular trading hours (approx. 73 % of the sample). The respective figure is some 23 %, documented in prior research (Patell and Wolfson (1982)). After trading hours, and Friday earnings announcements also tend to contain to a larger degree bad news, according to earlier studies (Penman (1987); Damodaran (1989)).

Bagnoli, Clement, and Watts (2005) find that outside of trading hours announcements do not seem to contain as much negative information as earlier studies report. However, it is verified that Friday earnings announcements tend to contain negative information. The authors do not solely attribute the release of bad news on Fridays as managers' strategic timing, but also to a muted market reaction and investors partly anticipating earlier in the week the bad news on Fridays. Additionally, managers may try to time the information release during Friday, to manage the market reaction over the weekend.

Shevlin and Thornock (2015) find evidence, for the notion that investors anticipate negative earnings announcements on Fridays. There is a negative market response, when firms inform investors of a forthcoming Friday earnings announcement. The authors use earnings announcement data from 2000 to 2011, inclusive. The central theme of the paper is to evaluate, whether managers try hide bad news, when investor attention is lower.

The authors verify that firms tend to issue negative news on Fridays, busy days, outside trading hours, and with less advance forewarning. However, Shevlin and Thornock (2015) do not find support for reduced investor attention on Fridays. The authors propose that the tendency of firms releasing bad news on Fridays might be, due to managers incorrectly assuming it as a reduced investor attention day. In all other aforementioned settings, earnings news seems to be met with a muted market response. The results of Hou, Peng, and Xiong (2009) are consistent with Shevlin and Thornock (2015), in that the effects of earnings momentum are larger in down markets and for low volume stocks. These conditions, circumstances proxy for lower investor attention.

## 2.8 Information incorporation

Hirshleifer and Teoh (2003) study how investor perceptions and market reactions are affected, depending on how firms choose to present financial information. In their model, investors are risk averse and limited investor attention is presumed. I.e. investor attention is presumed to be a limited cognitive resource. The authors find that even when the information content is equivalent, how information is presented – i.e. the form – does matter and affects investors' information processing. Also, there is a difference in the market reaction, depending on if items are “recognized as part of earnings, or merely disclosed as a footnote” (Hirshleifer and Teoh (2003, p. 338)). Specifically, the authors focus on three types of information releases: pro forma earnings disclosures, employee option compensations and degrees of aggregation in reporting.

Overall, the study provides some interesting implications and predictions to why the form of presenting financial information matters. Hirshleifer and Teoh (2003) present that when pro forma earnings announcements contain non-GAAP disclosures, investors are prone to provide a higher valuation to the announcing firms' stock. However, according to the authors, stock prices may also reflect fundamental value more precisely, when non-GAAP disclosures are included in pro forma earnings announcements. Thus, it is not directly implied that the inclusion of non-GAAP disclosures causes overvaluation.

The authors also note that investors may fail to fully distinguish between the information content of firms' accruals and cash flows. This seems valid, since presumably there are investors involved in e.g. the stock market, who do not fully distinguish between the differences of a profit and loss statement and a cash flow statement. As per the authors, this may help explain post-earnings announcement drift. In particular, the relation between firms' accruals and earnings momentum abnormal returns, which is documented in Sloan (1996). Hirshleifer and Teoh (2003) note that investors seem to overreact to accruals related news and underreact to cash flow related news, and that companies may take advantage of this investor tendency through manipulating earnings information. Some examples mentioned, where this is documented, include Teoh, Welch, and Wong (1998) and Xie (2001).

Hirshleifer and Teoh (2003) present somewhat twofold results in regard to the expensing of employee stock options, when they are granted. Not fully expensing stock options when granted, can according to the authors, lead to overvaluation of firms' stock. However, fully expensing them can lead to undervaluation. Whether firms utilize financial reporting, at the

segment or aggregate level also seems to matter. The authors findings suggest that earnings should be reported at the aggregate level, when investors have limited attention. Investors are prone to put more emphasis on the segments with low growth at the expense of the segments with high growth, when estimating earnings at the aggregate level (Hirshleifer and Teoh (2003)). This is an interesting implication, as one would assume that financial reporting at the segment level, would provide improved information value and better insight to how the firm performs at the segment level.

On the whole, the findings of Hirshleifer and Teoh (2003) are in line with e.g. Odean, and Zheng (2005), in that investors are more sensitive to salient, easily noticeable and understandable information. Another example of this is that investors do not seem to fully account for off balance sheet items in valuing firms (Hirshleifer and Teoh (2003)).

Peng (2005) studies the learning process of an investor with a capacity constraint, namely limited attention. In the authors model, information is treated as endogenous, since incorporating information requires time and effort, both of which are limited resources. According to the author, the model presumes that the investor tries to minimize the total uncertainty of her portfolio of financial assets. This is achieved by optimally allocating attention to multiple sources of uncertainty, i.e. the different individual financial assets in the portfolio. The author's model is quite detailed, but the main implication of the paper is that large firms' stocks incorporate information at a faster pace compared to those of smaller firms. As per Peng (2005) this is due to investors allocating more attention to large stocks in their portfolio, since they contribute more to the total portfolio uncertainty. On an aggregate level large stocks receive more attention. Larger stocks also seem to adjust to fundamental shocks at a faster rate and are less vulnerable to external shocks (Peng (2005)).

Peng and Xiong (2006) extend the analysis of Peng (2005), in studying how investor learning affects asset prices. Also in this model, investors possess limited attention and information is treated as endogenous. According to the authors, "limited attention leads to "category learning" behavior: an attention-constrained investor tends to allocate more attention to market- and sector-level factors than firm specific factors." (Peng and Xiong (2006, p. 2). Also, if attention is truly scarce, investors might disregard firm-level information altogether in favor of aggregate-level data. This seems intuitive, as if an investor is under time and attention pressure, he/she does not necessarily have the resources to dig into all the detailed information.

The authors mention an interesting example, where this effect might have been at play. Namely, firms that renamed themselves, to include the dot.com ending during the dot-com boom. As per Peng and Xiong (2006), without changes in fundamentals, these companies' stocks exhibited substantial abnormal performance during the name change announcements, compared to those that did not participate in such practices. This is documented in Cooper, Dimitrov, and Rau (2001). However, the reasoning in the aforementioned example is not exactly clear, since it is the market- and sector-level factor that is drawing attention away from the firm-specific level. It is true that investors might have paid so much attention to market wide and sector wide information that they disregard firm-specific information, but here it is not something else than market and/or sector wide information that has limited investor attention, which causes them to disregard firm-specific data.

In a way this is an interesting analogy, since it could be extended to my study as well, if I measured the market response to e.g. earnings surprises, when there are multiple mergers and/or acquisitions announced at the same time. Mergers can be expected to be of higher importance to earnings surprises, but is firm-level data or market wide data more important in valuing companies? I would expect that individuals investing in companies would at least be somewhat familiar with the market, sector a company operates in before investing, thus making the market wide data the primary information channel.

DellaVigna and Pollet (2007) tap in to the limited attention discussion, by studying how changes in demographic factors affect the stock performance in different industries – 48 in total. The time period under inspection is 1939-2003. The authors build a cohort growth rate forecast model based on past information, and report quite accurate estimations over a ten-year time period, compared to the real cohort growth rates. As per the authors, future cohort sizes of different age groups are estimated by inspecting current cohort sizes, mortality and fertility rates (DellaVigna and Pollet (2007)). Essentially, the authors build a forecast model that estimates the consumption of specific goods – industries – based on estimated sizes of different age groups. Since different age group spend money on specific services, e.g. toys, housing, it provides estimates of future consumption rates across industries. Of the authors' specific interest is, when stock prices adjust to the estimated growth rates of demand in goods across different industries – e.g. profitability.

As per DellaVigna and Pollet (2007), estimated long-term demand increases – 4 to 8 years - predict abnormal stock performance, while short-term demand increases do not. According to

the authors, limited attention is a possible explanation, whereby investors have short horizons and do not fully account for the estimated long-run demand increases across different goods, industries. The authors note that a trading strategy exploiting this pattern can yield substantial annual abnormal returns of approx. 6 %.

## 2.9 Weekday variations and characteristics

There are studies indicating that investors are less attentive to corporate announcements on Fridays – a proxy for investor inattention. DellaVigna and Pollet (2009) report that compared to other weekdays Friday earnings announcements are met with a lower immediate and higher delayed market reaction, due to investor distraction. Their findings suggest that limited investor attention drives underreaction to new information and helps explain post-earnings announcement drift. Louis and Sun (2010) test for the inattention hypothesis in an even larger corporate event setting, namely merger announcements. Given the high importance of these events it could be assumed that they always attract sufficient investor attention, regardless of the weekday they are announced. However, Louis and Sun (2010) observe a muted market reaction for Friday stock swap announcements compared to other weekdays.

The results of these studies are quite interesting, as they find significant results for both abnormal trading volumes and abnormal returns in regard to Friday announcements. They also provide some insightful implications, e.g. in regard to strategic timing. Managers who seek to maximize short-term value could strive to release worse earnings announcements on Fridays. In the case of merger announcements and reported results of Louis and Sun (2010) the conclusion is partly true.

For public acquirers, stock-for-stock acquisitions involving publicly owned targets are on average met with a negative market reaction, while the effect is opposite for privately owned targets (Louis and Sun (2010)) – see e.g. Chang (1998); Fuller, Netter, and Stegemoller (2002); Moeller, Schlingemann, and Stulz (2005); Louis (2005); Gong, Louis, and Sun (2008). Thus, managers who maximize short-term value could seek to announce stock swap mergers involving publicly owned targets on Fridays, and avoid doing this in the case of privately owned targets. However, given that the authors find positive differential abnormal returns and lower abnormal trading volumes for Friday stock swap announcements involving publicly owned

targets, limited attention seems to be the likelier explanation rather than strategic timing (Louis and Sun (2010)).

A point to consider, is that the distribution of earnings announcements show highly seasonal patterns and seem to cluster depending on the day of the week (Hirshleifer, Lim, and Teoh (2009)). Damodaran (1989) finds the highest number of earnings announcements occurring on Tuesdays followed by Wednesday, Thursday, Monday, and the lowest on Friday. DellaVigna and Pollet (2009) show similar results with more recent data. This carries some implications for my research as well.

Most of the Friday merger announcements in my sample are likely to occur during “non-high-news days”. Since prior studies suggest that there is a muted market reaction to corporate announcements that are made on Fridays the interpretation of my results likely becomes more complicated. To a certain degree this also provides a natural setting for excluding the effect of Friday announcements from the analysis. However, bias towards “high-news days” including the Friday effect will likely be reduced.

In regard to stock swap mergers, the number of announcements is highest on Mondays and clearly lowest on Fridays, as documented by Louis and Sun (2010). I also observe this in my sample. Of all observations, the merger announcements occurring on Fridays are 15.1 % and 13.5 % for public targets and private targets respectively. These figures deviate considerably from the approx. 20 % that could be assumed under classical assumptions.

An interesting notion, is that for private targets, I observe the highest number of mergers announced occurring on Tuesdays. This differs from the weekly distribution characteristics of Louis and Sun (2010). Otherwise, I find similar weekly distribution characteristics. As the authors note, a possible reason for high Monday percentages is that deals can be negotiated and approved over the weekend and announced at the beginning of the week. However, this reasoning fails to explain why there is a lower amount of merger announcements made of Fridays compared to Wednesdays and Thursdays (Louis and Sun (2010)). This applies to my sample as well.



## 2.10 Merger Monday

A directly linked topic to weekday variations in corporate announcements, is the Wall Street Merger Monday phenomenon. Also described in Louis and Sun (2010), see e.g. Kramer (1995 p. C9). According to the general impression, companies announce mergers and acquisitions at the beginning of the week to achieve a maximum amount of publicity and attention to the transactions. As documented in Louis and Sun (2010), managers who make M&A announcements at the beginning of the week, often state this as the reason indeed. While managers are not directly expressing that they avoid e.g. Friday announcements, due to limited investor attention, it implies a lower perceived level of investor attention at the end of the week and on Fridays.

There have been some interesting and somewhat contradicting more recent news coverage on the Merger Monday phenomenon.<sup>9</sup> In a Bloomberg video article the representative makes some noteworthy statements, such as "... we always refer to Monday as Merger Monday, and if you don't have a busy Merger Monday, you usually think that the rest of the week is going to be quiet".<sup>10</sup> According to the article, most M&A transactions up to that point in 2015, had been announced on Wednesdays, based on deal value. Based on volume, most deals were announced on Tuesdays. The correspondent does not give a clear explanation to the shift from Monday to Tuesday and Wednesday. However, she offers a theory about markets being so volatile in 2015 that Monday is perhaps a good day to assess the week, and if it's the kind of environment companies want to announce a big merger in. She also mentions that Friday is showing surprisingly much activity, which is unexpected "because Friday used to be the day that companies would try to bury the bad news before the weekend".

The actual distributions offered for number of transactions announced year-to-date (May 13, 2015) are 21.5 %, 22.3 %, 20.0 %, 19.1 %, 14.7 %, 0.9 %, and 1.6 % from Monday through Sunday respectively. Compared to my sample, and that of Louis and Sun (2010), they show a lower distribution of deals announced on Mondays, but not clearly higher or lower for Fridays. Perhaps more interesting than the limited data offered in the article, is the implication of managers strategic timing of M&A deals according to market sentiment.

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<sup>9</sup> Udland, M. 2016. Over \$37 billion in deals has been announced in a massive 'Merger Monday'. Business Insider UK (March 21), <http://uk.businessinsider.com/merger-monday-march-21-2016-3?r=US&IR=T>.

<sup>10</sup> Lachapelle, T. 2015. Has Merger Monday Moved to Wednesday? Bloomberg (May 13), <http://www.bloomberg.com/news/videos/2015-05-13/has-merger-monday-moved-to-wednesday->.

Another 2015 news report by MarketWatch, Inc., states that Merger Monday has shifted towards Tuesday and Wednesday, or even Thursday.<sup>11</sup> The article includes some interesting points from Mark Oshima, senior vice president of business integration at Aon Hewitt Plc. In accordance to the previous article, he theorizes that companies might wait an extra day or two to get a feel of the market, and if they can expect a favorable announcement reaction. He states that “you might see a bit of a correlation there”. However, perhaps the most interesting comments come from Tom Herd, a managing director at Accenture Plc. He sees that the rise of social media has increased fears of M&A developments leaking out before official company announcements. Thus, companies are prompted to announce deals when they are ready, rather than wait. He also states that “I think the ability to wait to place it on a Monday morning is being cut off... I think controlling the information is part of the reason”. This reasoning could offer some explanation to a possible shift from Monday announcements to other weekdays.

Contrary to the previous articles, CNBC reports that the weakening of the Merger Monday effect has been widely exaggerated.<sup>12</sup> The article presents the percentage distribution of 1995-2015 announced U.S. M&A deals valued at more than \$1 billion.<sup>13</sup> The proportion of Monday announcements is considerably high, e.g. 37 % during 2014 and 33 % year-to-date (August 17, 2015). The yearly numbers of announcements drop consistently towards Friday, with a few exceptions. On average, the portions of Monday announcements, are clearly higher than those reported in Louis and Sun (2010). The average distributions of Friday announcements are also lower.<sup>14</sup> For the whole sample, the averages are 35.5 %, 19.5 %, 15.1 %, 15.7 %, 10.7 %, 0.7 %, 3.0 % from Monday to Sunday respectively.

The article also presents some interesting notions about M&A announcements and other corporate announcements. Neil Dhar, a partner from PwC, states that “strategy behind scheduling an M&A announcement usually has more to do with other corporate calendar events”. Among those listed are avoiding conflicts with product launches, getting ahead of a leak and quarterly earnings announcements. This makes very much sense, but especially

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<sup>11</sup> Britt, R. 2015. ‘Merger Monday’ now falls on Tuesday, Wednesday or even Thursday. MarketWatch (May 27), <http://www.marketwatch.com/story/merger-monday-now-falls-on-tuesday-wednesday-or-even-thursday-2015-05-27>.

<sup>12</sup> Chemi, E. and Wells, N. 2015. The truth about Merger Monday. CNBC (August 17), <http://www.cnbc.com/2015/08/17/the-truth-about-merger-monday.html>.

<sup>13</sup> Even higher Monday distributions for smaller transactions are stated, although the data is not presented. Thus, this claim cannot be accepted at face value.

<sup>14</sup> In my sample, the merger announcement distribution of public targets is lower on Fridays compared to the equivalent of private targets. Here, the whole 1994-2014 sample period is considered, presented further on in the descriptive statistics section.

quarterly earnings announcements are of interest in this study. Surely, a company would avoid announcing an M&A transaction colliding with their own quarterly earnings announcement to receive maximum attention to the deal. However, the comments also imply that quarterly earnings announcements could be a potential source of investor distraction. This lends some credit to the notion that, a high amount of earnings announcements occurring at the same time, could distract investors.

For further comparison, I divide my stock swap merger sample to two periods, 1994-2006 and 2007-2014 (see Appendixes 2 and 3). I select the cutoff as December 2006, since the study of Louis and Sun (2010) covers the time period 1994-2006 (see Louis and Sun (2010) for the exact distributions). Comparing these, I find that the percentage shares of transactions have rather increased on Mondays, as well as Thursdays. This applies for both public and private targets. The percentage shares of Tuesday, Wednesday and Friday announcements have decreased. The distribution of observations is heavily favored towards the beginning of the 1994-2014 period (see Appendix 1). In my subsamples, the time period of 1994-2006 includes 2 496 observations. The respective figure for 2007-2014 is 337. However, they do highlight variations in distributions over different time periods. The increase in Thursday announcements is somewhat puzzling, whereas Friday announcements have decreased.

The strategic timing of deals might have increased during recent years – although the news leakage argument works against this - but does not seem to go in favor of Fridays at the least. Perhaps Friday is still widely regarded as a low investor attention day, due to the upcoming weekend and other effects. Overall, news stories seem to be partly driven by gut feeling, generalizations and attention grabbing headlines. There might be a shift during recent years from Monday deal announcements to Tuesdays and Wednesday. But with my sample spanning to the end of 2014 and covering stock swap mergers only, the theories and claims are hard to definitively either confirm or deny.

### 3. Data

In this section, I will go through the process of collecting the stock swap merger announcement sample, along with which data items are included in the sample. The section also covers some descriptive notions about my sample, and limitations of the data used in my study.

#### 3.1 Merger announcements

My thesis contains announcements of stock swap mergers between U.S. companies, made between January 1, 1994 and December 31, 2014. It includes stock swap announcements, where the acquirer's status is public and the target's status is either public or private. The sample for mergers is obtained from the Security Data Company (SDC) database.

As per the study by Louis and Sun (2010), a transaction is deemed a stock swap, if more than 50 % of its value is financed with stock. An observation is included in the sample, if the method of payment and transaction value are reported on SDC, the form of the transaction is a merger (as defined on SDC), the acquisition technique is defined as a stock swap, deal status is completed, and the transaction value is at least 5 million dollars.

The initial sample from SDC includes 6 095 stock swap announcements (3 084 public targets and 3 009 private targets). There are however multiple observations, where the percentage of stock used is below 50 %. After adjusting for these observations, the sample size drops somewhat to 5 731 stock swap announcements (2 848 public and 2 883 private targets).

In the initial SDC sample, the average stock financing is 91.94 % for public targets and 94.05 % for private targets. The initial average total transaction values, are 1 732 million USD for public targets and 107 million USD for private targets. Respectively, the median total transaction values, are 165 million USD for public targets and 29 million USD for private targets. For example, the largest deal in the initial sample, is the stock swap merger between America Online Inc. and Time Warner, announced 10.1.2000, with a total transaction value of 164 747 million USD.

### 3.2 Quarterly earnings announcements and stock data

The sample for publicly listed companies' earnings announcements in North America, is gathered from the Compustat Fundamentals Quarterly (RDQ - Report date of quarterly earnings) database, and requirements follow the approach of Hirshleifer, Lim, and Teoh (2009). Quarterly earnings announcement data, is used to calculate the daily number of quarterly earnings announcements. To calculate both merger announcement abnormal returns and trading volumes, necessary daily stock data is gathered from the Center for Research in Security Prices (CRSP) database. Acquiring firms' 6 digit Cusip identifiers from the SDC sample, are converted to CRSP 8 digit Cusip identifiers. I include firms that have a CRSP share code of 10 in my sample. Thus, only ordinary common shares are included.

### 3.3 Balance sheet items

To maximize the sample size, I have chosen not to require Compustat data – e.g. net income, total assets – for the acquiring firms in my univariate tests with the CRSP matched SDC sample. The primary focus in this study is to test for the inattention hypothesis, if a higher number of earnings announcements during stock swap merger announcement days causes a muted market reaction. I.e. if there is an underreaction effect caused by investor distraction, limited investor attention.

However, as Louis and Sun (2010) find statistically significant regression coefficients for size, relative size and book-to-market when the dependent variables are the cumulative abnormal returns and trading volumes, I include these as control variables in my multivariate subsample regression analysis tests. More specifically, *lnsize* (size) is the natural log of the acquirer's total market value of equity 20 days prior to the merger announcement; *relsize* (relative size) is the ratio of the transaction's total value to the acquirer's market value of equity 20 days prior to the merger announcement; *bm* is the acquirer's book-to-market value of equity at the end of the quarter prior to the merger announcement (Louis and Sun (2010)). Acquirers' market values of equity are gathered from CRSP. Acquirers' book values of equity are gathered from the Compustat Fundamentals Monthly database, using the CEQ (60) data item.

### 3.4 Sample for the univariate tests

After matching the SDC sample with CRSP, the final sample includes 2 833 stock swap announcements (1 529 public and 1 304 private targets). I have chosen to exclude transactions, where the acquirers' stock value is below 1 USD prior to the merger announcement. This does not considerably affect the sample as the final sample size would have been 2 841 stock swap announcements (1 531 public and 1310 private targets), without the consideration.

After matching the SDC data with the CRSP database, the daily numbers of quarterly earnings announcements are assigned to the corresponding merger announcement dates. The specific daily numbers of quarterly earnings announcements are sorted according to their decile rank of announcements made during the same quarter. Days that are in the top (bottom) decile of earnings announcements during the same quarter, are categorized as "high-news days" and "low-news days", in line with Hirshleifer, Lim, and Teoh (2009).

An alternative approach of categorizing the specific days as high-news days and low-news days could be taken, when sorting the final sample, i.e. categorizing based on the daily number of earnings announcements across the whole time period of 1994-2014. However, this would not take into account the differences in the number of daily earnings announcements, during different quarters and years. Thus, the method of sorting according to the announcement quarter, takes into account the relative information load investors face during the specific quarter.

In the case of stock swaps involving privately owned targets, there is one observation with some missing trading volume values. Thus, the trading volume sample size is one observation lower, than the sample used for calculating differences in abnormal returns. This observation is the stock swap merger between HomeSeekers.com Inc. and Terradatum Llc, announced on September 22, 1999.

### 3.4 Sample for the multivariate tests

After collecting book-to-market value of equity data for the acquirers, the sample size for my multivariate regression tests drops somewhat, to a total of 2 574 observations – 1 222 for stock swaps involving privately owned targets, and 1 352 for stock swaps involving publicly owned

targets. In total, 259 observations are omitted from my univariate test sample – 82 when the target's status is private, and 177 when the target's status is public.

### 3.5 Limitations of the data

The final sample size for my univariate tests, is significantly lower than that of Louis and Sun (2010), even though the time period considered in my sample is 8 years longer. This is likely to a large part, due to my study only including CRSP share code 10 observations. Thus, CRSP share code 11 observations are omitted. The sample of Louis and Sun (2010) includes 3 995 stock swap announcements in total – 2 227 for public targets and 1 764 for private targets. Nevertheless, my final sample includes observations for years that are not included in their sample, i.e. years 2007-2014. As reported further on in the descriptive statistics section, the number of stock swap deals have dropped considerably after the 1998-2002 time period, for both public and private targets. Thus, although my sample includes observations during 2007-2014, the earlier years are heavily favored in terms of number of observations.

Ultimately, the most important aspect of my study is to find the necessary daily stock data from CRSP, to calculate both acquirers' merger announcement abnormal returns and trading volumes, which is why I have chosen to exclude additional Compustat requirements for the main sample. The multivariate tests are carried out for the subsample, to test whether the univariate results hold, when controlling for the acquirers' size, book-to-market values and the relative size of the transactions.

## 4. Methods

In this section, I will go through the methods used, to carry out the tests for a potential muted market reaction regarding stock swap announcements on Fridays and high-news days. The primary focus is to test for the investor distraction hypothesis, i.e. if a higher number of earnings announcements occurring during the same day as a stock swap merger announcement, causes a muted market reaction. Both acquirers' abnormal trading volumes and returns are considered. I additionally study the Friday phenomenon, as in Louis and Sun (2010), to observe if there is a muted market reaction to merger announcements made on Fridays. The main aim here is to replicate their study, for comparative purposes.

### 4.1 Quarterly earnings announcements

Quarterly earnings announcement data is used to calculate the daily number of quarterly earnings announcements. As described earlier, the days that are in the top and bottom decile for the daily number of earnings announcement, during the same quarter, are categorized as high-news days and low-news days respectively. The approach follows that of Hirshleifer, Lim, and Teoh (2009).

### 4.2 Cumulative abnormal returns

The abnormal, excess return of a stock is defined as:

$$(1) AR_{it} = R_{it} - E(R_{it})$$

where  $R_{it}$  is the return of the firm's stock  $i$  at the time period  $t$ ,  $E(R_{it})$  is the expected return of the firm's stock  $i$  at the time period  $t$ , and  $AR_{it}$  is the abnormal, excess return for the firm's stock  $i$  at the time period  $t$ . The  $E(R_{it})$  component, expected return of a security can be estimated using different models. Some examples include the Capital Asset Pricing Model (CAPM) or Fama-French Three-Factor Model (FF3FM). See, e.g. Sharpe (1964), Fama and French (1992, 1993). In this study I use the CRSP value-weighted index return for a given stock  $I$  at the time period  $t$ , as its expected return  $E(R_{it})$ . This approach is also used in Louis and Sun



(2010). The CRSP value-weighted index, is a value-weighted portfolio built each calendar period using all issues listed on The New York Stock Exchange (NYSE), The American Stock Exchange (AMEX) and The Nasdaq Stock Market (NASDAQ), with available share volume and price data, excluding American Depositary Receipts.<sup>15</sup>

To calculate cumulative abnormal returns over days 0 and +1, I use the following approach:

$$(2) CAR_i = \prod_{t=0}^i (1 + R_{it}) - \prod_{t=0}^i (1 + R_{it}^{VW})$$

where  $R_{it}$  is the return of the firm's stock  $i$  at the time period  $t$ ,  $R_{it}^{VW}$  is the CRSP value-weighted return of the firm's stock  $i$  at the time period  $t$ , and  $CAR_i$  is the cumulative abnormal return of the firm's stock  $i$  over the 2-day window (0,+1) around the announcement.

### 4.3 Abnormal trading volumes

I calculate abnormal trading volumes according to the following formula:

$$(3) VOL[j] = \text{Log}(\text{DollarVol}_{t+j} + 1) - \frac{1}{10} \sum_{k=t-20}^{t-11} \text{Log}(\text{DollarVol}_k + 1)$$

where abnormal trading volume on day  $j$  relative to the announcement date  $t$  is defined as a normalized difference between the log dollar volume on day  $j$  and the average log dollar volume over days [-20, -11] (Hirshleifer, Lim, and Teoh (2009)). The abnormal trading volume over days 0 and +1 is calculated, as the average of abnormal trading volumes on the announcement day (VOL[0]) and the next day (VOL[1]). I.e. abnormal trading volume for the 2-day event window is defined, as the average of abnormal trading volumes over days 0 and +1 relative to the merger announcement date (day 0). A similar approach is used in DellaVigna and Pollet (2009), and I use their approach of benchmarking for days -20 through -11. Hirshleifer, Lim, and Teoh (2009) calculate trading volumes over days -41 to -11.

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<sup>15</sup> [http://www.cob.unt.edu/firel/data/stock\\_ind\\_data\\_descriptions.pdf](http://www.cob.unt.edu/firel/data/stock_ind_data_descriptions.pdf)

#### 4.4 Univariate analysis

I perform univariate analysis, to study the hypothesized muted market reaction effect, using t-tests for differences in means. More specifically, I test whether, on average, bidders' abnormal returns and trading volumes for stock swap announcements on high-news days, differ significantly from bidders' abnormal returns and trading volumes, when stock swaps are announced on low-news days and non-high-news days. As earlier mentioned, the control groups are thus low-news days and all non-high-news days. The t-tests are carried out separately for stock swaps that involve private and public targets.

In similar fashion, t-tests for mean differences are carried out between Friday and non-Friday bidders, in stock-for-stock merger announcements. Separately for transaction that involve private and public targets. Here, there is only one control group, namely non-Friday. This approach is the same that Louis and Sun (2010) use.

It is important to note, that the t-tests for differences in mean, assume unequal variances. This is the approach Louis and Sun (2010) have used, when studying the Friday investor inattention hypothesis. Ex-ante, it is not entirely clear, why this should be the case. Louis and Sun (2010) provide no further explanation as to the reason, except for providing the information in their table descriptions. However, assuming equal variances in the univariate t-tests does not materially affect my results – and neither their results.

As a final notion, dates categorized as high-news days, very rarely occur during Fridays. In my sample, for stock swaps involving privately owned targets, the figure is 0.54 % (7 out of 1 304 observations). When target status is public, the figure is 0.13 % (2 out of 1 529 observations). Thus, Fridays should be relatively well controlled for, even in my univariate t-tests for mean differences between high-news days and low-news days/non-high-news day. The same applies vice versa.

## 4.5 Multivariate analysis

I perform multivariate OLS regression tests, to control for other possible determinants and distinguish between the effects of Fridays and high-news days. In the tests, I have included the variables *lnsize*, *relsize* and *bm*, since Louis and Sun (2010) find statistically significant values for the determinants in their multivariate tests. These are defined as the natural log of the acquirer's total market value of equity 20 days prior to the merger announcement, the ratio of the transaction's total value to the acquirer's market value of equity 20 days prior to the merger announcement, and the acquirer's book-to-market value of equity at the end of the quarter prior to the merger announcement (Louis and Sun (2010)). In my multivariate sample, dates categorized as high-news days, occur according to the same percentages as presented in the univariate analysis Section 4.4. Thus, none of these observations have been excluded.

I perform multivariate regression tests for abnormal returns and trading volumes, where the dependent variables are the average cumulative abnormal returns and average abnormal trading volume over days 0 and +1. These are performed for stock swap merger announcements involving both publicly and privately owned targets.

*highnews* is a binary variable taking the value of 1, if the merger announcement occurs on a high-news day (top decile of daily number of quarterly earnings announcements), and 0 otherwise. Respectively, *friday* is a binary variable taking the value of 1, if the merger announcement occurs on a Friday, and 0 otherwise. The formulas are defined as:

$$(4) CAR_i = \beta_0 + \beta_1 highnews + \beta_2 friday + \beta_3 lnsize + \beta_4 relsize + \beta_5 bm + \varepsilon_i$$

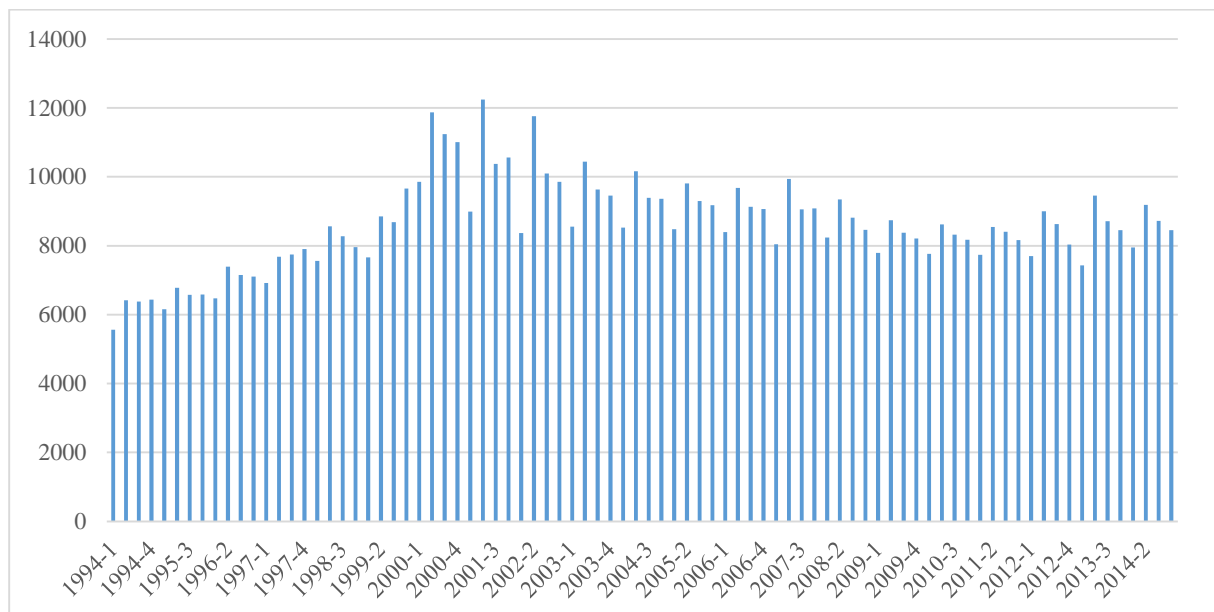
$$(5) ATV_i = \beta_0 + \beta_1 highnews + \beta_2 friday + \beta_3 lnsize + \beta_4 relsize + \beta_5 bm + \varepsilon_i$$

## 5. Empirical findings

This section presents my empirical findings of the tests carried out, along with descriptive statistics. The first part covers descriptive statistics of the earnings announcement and the stock swap merger announcement sample. Second, I present my univariate findings in regard to the proposed investor distraction hypothesis on high-news days. Third, I go through my univariate results for the proposed investor inattention hypothesis on Fridays. Last, I present the results of my multivariate tests with the control variables *lnsize*, *relnsize*, *bm*.

### 5.1 Descriptive statistics

Figure 1: Quarterly distribution of quarterly earnings announcements from January 1994 to December 2014



The figure above presents the quarterly distribution of quarterly earnings announcement from January 1994 to December 2014, in North America. The time period covers 722 111 quarterly earnings announcements in total. As can be seen, the number of quarterly earnings announcements peak during the 2000-2002 time period at approx. 12 000. This is in line with historical data about the number of publicly listed companies in North America. The amount of quarterly earnings announcements has declined somewhat since then, presumably due to the

decrease of U.S. stock market listings since 1999.<sup>16</sup> According to the Wall Street Journal, the amount of U.S. stock market listings increased in 2013 for the first time since 1999. This is consistent with the figure above, where the number of quarterly earnings announcements have increased during the 2012-2014 time period.

The yearly and quarterly variations in the number of quarterly earnings announcements are not an issue in my study, since I group high-news days and low-news days, i.e. top and bottom deciles for daily number of earnings announcements, according to the distribution of daily earnings announcements during the specific fiscal announcement quarter. Thus, a day receives the high-news day (high distraction day) status, when it is in the top decile in the number of earnings announcements during the specific quarter (e.g. 1999Q1). This improves the analysis, compared to grouping days according to the daily distribution of earnings announcements during the whole sample period of 1994 to 2014, and better measures the relative information load that investors face during the specific quarter and date. Hirshleifer, Lim, and Teoh (2009) also use this method.

Table 1: Quarterly earnings announcement descriptive statistics 1994-2014						
Panel A: Distribution of daily number of quarterly earnings announcements						
Mean	SD	Percentiles				
		P10	P25	Median	P75	P90
136.7	145.1	23.0	39.0	84.0	186.0	325.0
Panel B: Percentage share of quarterly earnings announcements per month						
January	February	March	April	May	June	
6.1 %	9.4 %	7.2 %	10.9 %	13.6 %	2.4 %	
July	August	September	October	November	December	
9.9 %	13.1 %	2.3 %	9.9 %	12.8 %	2.4 %	
Panel C: Percentage share of quarterly earnings announcements per weekday						
Monday	Tuesday	Wednesday	Thursday	Friday		
17.2 %	21.5 %	22.5 %	25.4 %	13.4 %		

The table presents the average and median values, standard deviation and percentile distribution of the daily number of quarterly earnings announcements from January 1994 to December 2014, along with percentage distributions across months and weekdays.

<sup>16</sup> <http://www.wsj.com/articles/SB10001424052702304851104579363272107177430>

The descriptive values in Panel A are close to those presented in Hirshleifer, Lim, and Teoh (2009), although somewhat higher. Their study covers the time period of 1995 to 2004. My study covers 10 additional years, 2005-2015, so the data presented varies somewhat.

The number of quarterly earnings announcements is lowest on Fridays. This is also the case for merger announcements. The implication is that Fridays are statistically likelier to be low-news days in my sample, which also holds on the basis of merger announcement distributions across weekdays. As earlier presented, the distributions of high-news days occurring on Fridays are 0.54 % and 0.13 %, when target status is private and public.

The Friday inattention phenomenon should thus be relatively well controlled for, even in my univariate tests. If the Friday inattention hypothesis holds, this can actually work against my hypothesis of a muted market reaction to stock swap merger announcements made on high-news days. This, because Fridays can decrease investor attention during low-news days and non-high-news days, i.e. causing a muted market response when stock swap mergers are announced on these dates. However, this is controlled for in the multivariate tests.

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Table 2: Distribution of stock swap merger announcements

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	Public target	Private target	Total
Number of observations	1 529	1 304	2 833
Percentage of the sample	54.0 %	46.0 %	100.0 %

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Table 2 presents the distribution of merger announcements according to the acquirer's public and private status. The total number of merger announcements between January 1994 and December 2014 is 2 833. The percentage distributions are quite close to those that Louis and Sun (2010) report. Their values are 55.8 % for public targets and 44.2 % for private targets. Thus, even though my sample size is smaller, the percentage distributions of merger announcements between private and public targets vary very little from those reported in Louis and Sun (2010).

Table 3: Daily distribution of the merger announcement sample

Panel A: Distribution for public targets					
	Announcement day				
	Monday	Tuesday	Wednesday	Thursday	Friday
Number of observations	454	308	284	277	206
Percentage of the sample	29.69 %	20.14 %	18.57 %	18.12 %	13.47 %
Panel B: Distribution for private targets					
	Announcement day				
	Monday	Tuesday	Wednesday	Thursday	Friday
Number of observations	292	308	252	255	197
Percentage of the sample	22.39 %	23.62 %	19.33 %	19.56 %	15.11 %
Panel C: Distribution for all targets					
	Announcement day				
	Monday	Tuesday	Wednesday	Thursday	Friday
Number of observations	746	616	536	532	403
Percentage of the sample	26.33 %	21.74 %	18.92 %	18.78 %	14.23 %

As can be seen from Table 3 above, the percentage share of Friday merger announcements is clearly lowest. For the whole sample, the share of Friday announcements is 14.23 %. The high share of Monday announcements in the case of public targets is interesting, since it deviates considerably from the ex-ante expected 20 % share. A possible explanation is the reported Merger Monday phenomenon, whereby firms seek to achieve maximum publicity for their deals, i.e. expecting that investor attention is high at the beginning of the week. Especially for the largest deals, this is a distinct possibility. However, there are some contradicting news reports about the persistence of the Merger Monday phenomenon, as presented in the earlier Prior Literature section.

Another interesting observation is the higher percentage share of Tuesday announcements compared to that of Monday, in the case of merger announcements that involve privately owned targets. This is also the case in Louis and Sun (2010), although the difference they report is even smaller. Also, the distribution from Monday through Thursday is closer to the ex-ante 20

% expectation. A possible explanation is that these deals receive considerably less publicity, compared to those of public targets, although the beginning of the week is still favored. This can somewhat decrease managers' incentive towards strategic timing of deals to Mondays and the beginning of the week.

If public acquirers of private targets expect the largest deals to be announced on Mondays, a higher share of firms may seek to announce transactions from Tuesday forward, to avoid going unnoticed in the favor of larger deals. I.e. announcement timing strategy might be more reactive, dependent on the weekday merger announcement distribution of larger public transactions. For example, in my sample the average total transaction value is some 8.6 times higher when target status is public, compared to that of private (see Table 4). However, as can be seen from the median values there is considerable dispersion in total transaction values. The smaller transactions are likely to receive less media attention and possibly as a result experience reduced investor attention. The minimum transaction values being close to 5 million USD is expected, since this is the sample selection cutoff criteria that I have used. The largest transaction in the whole sample is the over 58 billion dollar merger between JPMorgan Chase & Co and Bank One Corp, Chicago, IL, announced 14.1.2004.

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Table 4: Stock swap merger sample transaction values (million USD)

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	Stock swaps involving privately owned targets	Stock swaps involving publicly owned targets
Mean	101.48	873.81
Median	29.20	103.73
Min	5.00	5.25
Max	19467.71	58663.15

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For the whole sample, the distribution of merger announcements across weekdays is consistent with that of Louis and Sun (2010). Thus, even though my sample size is smaller, the weekday characteristics still hold on an aggregate level. Monday and Friday distributions clearly deviate from the ex-ante expected 20 % share, and the number of announcements consistently decrease from Monday through Friday.



## 5.2 High-news day merger announcement differential abnormal returns

The acquirers' abnormal returns are calculated, as defined in equations (1) and (2). The expected return for a stock  $i$  during the time period  $t$ , is its CRSP value-weighted index return. I.e. acquirers' returns are proxied by the market-adjusted returns, as in Louis and Sun (2010), using the CRSP value-weighted index. I compare the abnormal returns for high-news days with both low-news days and all non-high-news days.

Merger announcement day	Stock swaps involving privately owned targets	Stock swaps involving publicly owned targets
Low-news days	0.0300 [4.67***] (N = 126)	-0.0207 [-4.65***] (N = 161)
All non-high-news days	0.0167 [6.27***] (N = 1151)	-0.0183 [-9.72***] (N = 1345)
High-news days	0.0044 [0.53] (N = 153)	-0.0208 [-4.90] (N = 184)
High-news days - Low-news days	-0.0256 [-2.43**]	0.0000 [-0.01]
High-news days - All non-high-news days	-0.0123 [-1.40*]	-0.0025 [-0.53]

The table presents the average values, t-values in brackets, and number of observations in parentheses. \*, \*\*, \*\*\* indicate statistical significance at the 1 %, 5 %, and 10 % level.

On an aggregate level, the signs of the average cumulative abnormal returns are consistent with prior studies reporting an average negative (positive) market reaction to announcements of stock swap deals involving publicly (privately) owned targets (Chang (1998); Fuller, Netter, and Stegemoller (2002); Louis (2005); Moeller, Schlingemann, and Stulz (2005); Louis and Sun (2010)). The differences in average cumulative abnormal returns show statistically significant t-values for stock swaps involving privately owned targets at the 5 % and 10 % level. The difference increases when high-news days are compared against low-news days, in lieu of all non-high-news days. All non-high-news days is the equivalent of the difference between all merger announcement days and high-news days. There seems to be a muted market reaction in regard to stock swaps involving privately owned targets during high-news days.

Stock swaps involving publicly owned targets do not exhibit a similar pattern. This is somewhat surprising. If there is a muted market reaction for merger announcements involving privately owned targets, one could expect the investor distraction phenomenon to persist in the case of stock swap announcements of publicly owned targets. A possible explanation is that the sizes of the acquirers and transactions are on average much larger and receive sufficient news coverage and media attention. I.e. the merger announcements are such high-priority news that they do not get buried beneath earnings announcement news.

For example, Louis and Sun (2010) report that the Friday muted market reaction effect seems larger for smaller acquirers. An acquirer's size is not perfectly correlated with total transaction value, but small acquirers seldom announce multibillion dollar mergers. Hence, there is a correlation between transaction values and the sizes of acquirers (e.g. market capitalization).

Table 6: Acquirers' average daily abnormal returns

Stock swaps involving privately owned targets					
	Low-news days (N = 126)	Non-high-news days (N = 1151)	High-news days (N = 153)	High-news days - Low-news days	High-news days - Non-high-news days
Day -1	0.0069 [1.82*]	0.0051 [3.88***]	0.0046 [0.81]	-0.0023 [-0.33]	-0.0004 [-0.08]
Day 0	0.0129 [3.03***]	0.0110 [6.57***]	0.0059 [1.12]	-0.0070 [-1.04]	-0.0051 [-0.92]
Day +1	0.0176 [3.17***]	0.0053 [3.12***]	-0.0024 [-0.44]	-0.020 [-2.57**]	-0.0077 [-1.35]
Stock swaps involving publicly owned targets					
	Low-news days (N = 161)	Non-high-news days (N = 1345)	High-news days (N = 184)	High-news days - Low-news days	High-news days - Non-high-news days
Day -1	-0.0016 [-0.62]	-0.0003 [-0.35]	0.0062 [2.76***]	0.0078 [2.26**]	0.0064 [2.73***]
Day 0	-0.0153 [-4.30***]	-0.0136 [-9.40***]	-0.0129 [-4.12]	0.0024 [0.50]	0.0007 [0.19]
Day +1	-0.0054 [-1.88*]	-0.0047 [-3.59***]	-0.0077 [-2.24**]	-0.0023 [-0.50]	-0.0030 [-0.82]

The table presents the average values, t-values in brackets, and number of observations in parentheses. \*, \*\*, \*\*\* indicate statistical significance at the 1 %, 5 %, and 10 % level.

For the acquirers of privately owned targets, the high-news day differentials are more pronounced for day +1 after the merger announcement. They are not statistically significant for days 0 or -1. Nor for day +1, when comparing high-news days and non-high-news days. Also, the acquirers' average abnormal returns during high-news days on day +1 are negative. Even though the differential values on the announcement date (day 0) are not statistically significant, the acquirers' average abnormal returns on high-news days are lower to those of low-news days or non-high-news days. I.e. for stock swaps involving privately owned targets the observed daily abnormal return pattern on days 0 and +1 is consistent with the investor distraction hypothesis.

For stock swaps involving privately owned targets, the pattern of acquirers' abnormal returns on high-news days and non-high-news days between day 0 and day +1, is also similar to what Louis and Sun (2010) report for Friday and non-Friday merger announcements. All non-high news days show a decrease in acquirers' abnormal returns between day 0 and +1. The effect is opposite for merger announcements on low-news days. This is somewhat surprising. One could expect the same effect to occur for low-news days. However, on a cumulative level, the reported pattern of acquirers' abnormal returns involving stock swaps of privately owned targets, appears to be in line with the investor distraction hypothesis of Hirshleifer, Lim, and Teoh (2009).

For stock swaps involving publicly owned targets, the results are quite different. All average abnormal returns are negative for days 0 and +1, in line with e.g. Chang (1998). I.e. there is on average a negative market reaction to stock swap announcement involving publicly owned targets. The high-news day differentials show statistically significant values for the day before the merger announcement, but not for the window (0,+1). There is a slightly less negative reaction for high-news days on the announcement date (day 0). The average negative abnormal return for low-news days is also higher than that of all non-high-news days. If investor distraction is not as strong during low-news days, this should be the case.

The negative differential for acquirers' average abnormal returns on high-news days and the other days is harder to interpret. Across days 0 and +1, the average negative abnormal returns decrease, but less so for high-news days. Based on these insignificant results it is hard to rule out other determinants that affect the merger announcement returns.

A further test of the previous and following trading days' high-news or low-news status would be of interest, since it would possibly help explain some of the noted patterns. Also, if there are

other mergers and acquisitions announcements and/or earnings surprises made during the same or the following date. For example, same day M&A announcements of other large deals could increase investor distraction.

Considering possible leakage of announcement information, the interpretation of the announcement window (-1,+1) abnormal returns are different for stock swaps involving privately and publicly owned targets. For privately owned targets, the high-news day acquirers' average abnormal returns are less positive compared to other days. The high news day differential values are not statistically significant. This does not support the leakage theory.

For stock swaps involving publicly owned targets the case is different. The high-news day differential values of the acquirers' average abnormal returns are statistically significant at the 5 % and 1 % level. Based on these results, possible prior leakage of merger announcement information involving publicly owned targets, cannot completely be ruled out. However, the positive average abnormal returns do not support the findings of prior literature (e.g. Chang (1998), in that if information was leaked, the price reaction should, on average, be negative.

Hirshleifer, Lim, and Teoh (2009) examine 30-day abnormal returns prior to earnings surprise announcements, and do not find a significant difference for high-news days and low-news days. However, merger announcements differ in regard to earnings surprises, and earnings news in general, in that they are largely unanticipated events. Thus, the authors' findings are not directly applicable in this setting.

### 5.3 High-news day merger announcement differential abnormal trading volumes

The calculation of abnormal trading volumes follows the methods of DellaVigna and Pollet (2009), Hirshleifer, Lim, and Teoh (2009), Louis and Sun (2010), as defined in equation (3). The acquirers' abnormal trading volumes on high-news days (top decile of quarterly earnings announcements) are compared with both all non-high-news days and low-news days (bottom decile of quarterly earnings announcements).

Table 7: Acquirers' average abnormal trading volumes over days 0 and +1

Merger announcement day	Stock swaps involving privately owned targets	Stock swaps involving publicly owned targets
	0.2055	0.3794
Low-news days	[4.38***] (N = 126)	[10.30***] (N = 161)
	0.1761	0.4002
All non-high-news days	[10.25***] (N = 1150)	[26.23***] (N = 1345)
	0.2525	0.2683
High-news days	[6.10***] (N = 153)	[6.99***] (N = 184)
High-news days - Low-news days	0.0470 [0.75]	-0.1111 [-2.09**]
High-news days - All non-high-news days	0.0763 [1.70*]	-0.1318 [-3.19***]

The table presents the average values, t-values in brackets, and number of observations in parentheses. \*, \*\*, \*\*\* indicate statistical significance at the 1 %, 5 %, and 10 % level.

For stock swaps involving publicly owned targets, the differences in the acquirers' average abnormal trading volumes over days 0 and +1, between high-news days and low-news days/non-high-news days, are negative and statistically significant at the 5 % and 1 % level. It is interesting that the differential for high-news days and low-news days is smaller than that of high-news days and non-high-news days. This does not fully support the distraction effect, whereby investor attention is presumably higher during low-news days, i.e. investor attention is closer to the optimal level.

Respectively, for stock swaps involving privately owned targets, the differential in the acquirers' abnormal trading volumes between high-news days and all non-high-news days is positive, and statistically significant at the 10 % level. The differential to low-news days is also positive, but not statistically significant. I.e. the differential in average values are smaller when comparing with low-news days. According to the investor distraction hypothesis, high-news days would exhibit lower average abnormal trading volumes over days (0, +1), when comparing against low-news days and non-high-news days. These results do not support the hypothesis of a muted market reaction over days 0 and +1.

	Privately owned targets				
	Low-news days (N = 126)	Non-high-news days (N = 1150)	High- news days (N = 153)	High-news days - Low-news days	High-news days - Non-high-news days
Day -1	0.0383 [0.76]	0.0352 [1.79*]	0.1041 [2.20**]	0.0658 [0.95]	0.0689 [1.34]
Day 0	0.1813 [3.43***]	0.1622 [8.22***]	0.2491 [5.19***]	0.0678 [0.95]	0.0869 [1.68*]
Day +1	0.2297 [4.21***]	0.1900 [9.11***]	0.2558 [5.34***]	0.0261 [0.36]	0.0658 [1.26]
	Publicly owned targets				
	Low-news days (N = 161)	Non-high-news days (N = 1345)	High- news days (N = 184)	High-news days - Low-news days	High-news days - Non-high-news days
Day -1	0.1146 [2.91***]	0.0663 [3.69***]	-0.0150 [-0.36]	-0.1296 [-2.25**]	-0.0812 [-1.78**]
Day 0	0.4053 [9.89***]	0.3832 [19.86***]	0.2404 [5.09***]	-0.1649 [-2.63***]	-0.1427 [-2.80***]
Day +1	0.3535 [8.99***]	0.4171 [23.94***]	0.2962 [6.76***]	-0.0573 [-0.97]	-0.1209 [-2.56**]

The table presents the average values, t-values in brackets, and number of observations in parentheses. \*, \*\*, \*\*\* indicate statistical significance at the 1 %, 5 %, and 10 % level.

For stock swaps involving publicly owned targets, acquirers' abnormal trading volumes are on average lower on all days (-1,+1), when comparing high-news days and low-news days/non-high-news days. The high-news day differentials are largest during day 0, but also statistically significant on day -1, when comparing with all non-high-news days.

According to these results, the acquirers' daily abnormal trading volumes are lower on high-news days, when stock swaps involve publicly owned targets. The interesting effect, is the smaller difference in the acquirers' abnormal trading volumes, between high-news days and low-news days, compared to that of high-news days and all non-high-news days. The difference stems primarily from day +1 average abnormal trading volumes. This is hard to explain solely based on the investor distraction hypothesis. Other determinants should also be considered, such as those presented earlier in the abnormal returns section.

The acquirers of privately owned targets, exhibit larger positive average abnormal returns on high-news days, when comparing with low-news days and all non-high-news days. This is not consistent with the investor distraction hypothesis, whereby high-news days can cause a muted trading volume response to merger announcements. Additionally, on day 0, the difference in the acquirers' average abnormal trading volumes between high-news days and all non-high-news days is positive and statistically significant at the 10 % level.

For stock swaps involving privately owned targets, the pattern of acquirers' statistically significant negative differential in average cumulative abnormal returns and positive average abnormal trading volumes, could be explained by higher dispersion of opinions for high-news day merger announcements (DellaVigna and Pollet (2009)). According to the authors, if the investor distraction hypothesis holds, the muted market response should hold for both abnormal returns and trading volumes, due to trading being the mechanism that causes prices to adjust. However, if the negative difference in abnormal returns (in their study, between Friday and non-Friday) is attributable to higher dispersion of opinions, the authors would expect a positive, rather than negative, differential in abnormal trading volume.

Again, I consider the possible prior information leakage of merger announcements. For stock swaps involving publicly owned targets, the acquirers' negative high-news day differential values on day -1, do not support this, although the t-values are statistically significant at the 5 % level. If there is leakage about a deal, the negative differential during day -1 should be less pronounced. It could occur, due to the previous day also being a high distraction day, high-news day. Thus, to gain further insight to the matter, the analysis should be extended. Respectively, for stock swaps involving privately owned targets, the differentials are positive, but not statistically significant.

As a whole, the results for the acquirers' abnormal trading volumes and returns on high-news days are mixed, but provide a few indications. For the acquirers, high-news days seem to cause

a muted price reaction, when stock swaps involve privately owned targets, and a muted volume reaction when stock swaps involve publicly owned targets. However, the results are not very robust, and other determinants should also be considered. The results suggest that the daily number of quarterly earnings announcements is perhaps not a very robust proxy for investor distraction, in the context of merger announcements. As mentioned, it would be interesting to extend the analysis further. E.g. the number of same day merger announcements, and the number of earnings announcements and surprises during the same, previous and following day of the merger announcement under inspection.

#### 5.4 The Friday effect

I study the proposed Friday investor inattention phenomenon (e.g. DellaVigna and Pollet (2009)) for comparative purposes, and to replicate the study of Louis and Sun (2010).

Table 9: Acquirers' average cumulative abnormal returns over days 0 and +1		
Merger announcement day	Stock swaps involving privately owned targets	Stock swaps involving publicly owned targets
	0.0186	-0.0218
Monday	[3.27***] (N = 292)	[-7.27***] (N = 454)
	0.0270	-0.0199
Tuesday	[4.14***] (N = 308)	[-5.11***] (N = 308)
	0.0104	-0.0210
Wednesday	[1.83*] (N = 252)	[-5.44] (N = 284)
	0.0144	-0.0161
Thursday	[3.23***] (N = 255)	[-3.72***] (N = 277)
	0.0181	-0.0120
All non-Friday	[6.29***] (N = 1107)	[-10.86***] (N = 1323)
	-0.0008	-0.0099
Friday	[-0.18] (N = 197)	[-1.93*] (N = 206)
	-0.0189	0.0101
Friday - non-Friday	[-3.52***]	[1.86*]

The table presents the average values, t-values in brackets, and number of observations in parentheses. \*, \*\*, \*\*\* indicate statistical significance at the 1 %, 5 %, and 10 % level.



The differences in Friday and non-Friday acquirers' average cumulative abnormal returns, show statistically significant results, for stock swap merger announcements involving both privately (1 % level) and publicly (10 % level) owned targets.

For Friday announcers and privately owned targets, the differential values show higher t-values of significance compared to Louis and Sun (2010). Respectively, for Friday announcers and publicly owned targets, the t-values of differences in means are less pronounced. Overall, the above results suggest that investor attention is lower on Fridays, i.e. that there is a muted market reaction to Friday merger announcements. Compared to non-Fridays, it seems that for Friday stock swap merger announcements, the acquirers' cumulative abnormal returns over days 0 and +1, are on average, less positive when the target is privately owned, and less negative when the target is publicly owned.

Table 10: Acquirers' average daily abnormal returns			
Stock swaps involving privately owned targets			
	Friday (N = 197)	Non-Friday (N = 1107)	Friday - non-Friday
Day -1	0.0003 [0.11]	0.0059 [3.90***]	-0.0056 [-1.93*]
Day 0	0.0041 [1.23]	0.0115 [6.44***]	-0.0074 [-1.96*]
Day +1	-0.0050 [-1.73*]	0.0060 [3.28***]	-0.0110 [-3.22***]
Stock swaps involving publicly owned targets			
	Friday (N = 206)	Non-Friday (N = 1323)	Friday - non-Friday
Day -1	-0.0012 [-0.58]	0.0008 [0.99]	-0.0020 [-0.88]
Day 0	-0.0014 [-0.47]	-0.0154 [-10.56***]	0.0140 [4.35***]
Day +1	-0.0085 [-2.11**]	-0.0045 [-3.57***]	-0.0040 [-0.95]

The table presents the average values, t-values in brackets, and number of observations in parentheses. \*, \*\*, \*\*\* indicate statistical significance at the 1 %, 5 %, and 10 % level.

The daily abnormal returns provide some further insight to the matter. My daily results differ somewhat from those of Louis and Sun (2010). For privately owned targets, the daily distribution of the differences in the acquirers' average abnormal returns on Friday and non-

Friday is similar to that of Louis and Sun (2010). This applies both for day 0 and +1, although the day after the merger announcement seems to be responsible for most of the effect (significant at the 1 % level).

When the target's status is public, Friday announcers' abnormal returns, are on average, less negative on the announcement date (day 0), compared to non-Friday announcers, and statistically significant at the 1 % level. Differences in means on day -1 are similar to what Louis and Sun (2010) report. On day +1, the difference is negative, which differs from the authors results, although it is not statistically significant. There might be a slight reversal in the differential Friday response, the following trading day, presumably Monday. However, since the value is not statistically significant, it cannot be given too much weight in the analysis.

Table 11: Abnormal trading volumes over days 0 and +1

Merger announcement day	Stock swaps involving privately owned targets	Stock swaps involving publicly owned targets
	0.1283	0.3889
Monday	[3.68***] (N = 292)	[16.41***] (N = 454)
	0.2768	0.3826
Tuesday	[8.87***] (N = 308)	[11.86***] (N = 308)
	0.1578	0.3909
Wednesday	[4.49***] (N = 251)	[10.39***] (N = 284)
	0.1464	0.4058
Thursday	[5.22***] (N = 255)	[12.68***] (N = 277)
	0.1805	0.3914
All non-Friday	[11.02***] (N = 1106)	[25.69***] (N = 1323)
	0.2107	0.3387
Friday	[4.09***] (N = 197)	[8.53***] (N = 206)
	0.0302	-0.0527
Friday - non-Friday	[0.56]	[-1.24]

The table presents the average values, t-values in brackets, and number of observations in parentheses. \*, \*\*, \*\*\* indicate statistical significance at the 1 %, 5 %, and 10 % level.

The acquirers' average abnormal trading volumes over days 0 and +1 provide some mixed results. For the acquirers of public targets, the Friday – non-Friday differential is negative, but not statistically significant. It provides some indication of a possible muted market response, however not robust enough, to warrant verification for the results that Louis and Sun (2010) show.

Respectively, for the acquirers of private targets, the equivalent differential value is positive, however not statistically significant. This is not consistent with the proposed Friday investor inattention hypothesis, and differs from the results of Louis and Sun (2010). The effect on trading volume is similar to the results I report for announcements of stock swap deals on high-news days, when the target's status is private. Again, the thoughts of DellaVigna and Pollet (2009) can provide some clarification, if the mixed results are due to dispersion of opinions.

Table 12: Daily abnormal trading volumes			
Privately owned targets			
	Friday (N = 197)	Non-Friday (N = 1106)	Friday - non-Friday
Day -1	0.0788 [1.25]	0.0370 [2.01**]	0.0418 [0.64]
Day 0	0.2171 [3.51***]	0.1645 [8.86***]	0.0526 [0.81]
Day +1	0.2044 [3.42***]	0.1966 [9.81***]	0.0078 [0.12]
Publicly owned targets			
	Friday (N = 206)	Non-Friday (N = 1323)	Friday - non-Friday
Day -1	0.1047 [2.81***]	0.0490 [2.68]	0.0557 [1.34]
Day 0	0.3502 [7.75***]	0.3685 [18.89***]	-0.0183 [-0.37]
Day +1	0.3272 [7.30***]	0.4143 [23.82***]	-0.0871 [-1.81*]

The table presents the average values, t-values in brackets, and number of observations in parentheses. \*, \*\*, \*\*\* indicate statistical significance at the 1 %, 5 %, and 10 % level.

Looking at the daily distribution, the acquirers of public targets exhibit a negative abnormal trading volume differential (Friday – non-Friday) over days 0 and +1 around the announcement

window. Day +1 seems to primarily be driving the effect (significant at the 10 % level). The differential is positive on day -1, but not statistically significant.

For day -1 and publicly owned targets, the acquirers' negative return differential and positive volume differential, are in the directions of possible preannouncement information leakage. This however seems unlikely, as neither of these differential values are statistically significant. As mentioned in Section 2.10, firms may seek to hasten the announcement of mergers and acquisitions, if there is concern of announcement information leakage.

For the acquirers of targets with private status, the differentials (Friday – non-Friday) in average daily abnormal trading volumes, are positive for all days around the announcement window (-1, +1). I.e. I do not notice a muted volume response, and none of the values are statistically significant.

Considering the results, I get, I cannot fully replicate the results of Louis and Sun (2010). My results for abnormal returns are somewhat consistent with their findings. Here, of primary concern is that for the acquirers of privately owned targets, most of the negative Friday – non-Friday average cumulative abnormal return differential is attributable to day +1. I.e. most of the muted market reaction is attributable to the following trading day.

In regard to abnormal trading volumes, my results for the acquirers of privately owned targets do not support the investor distraction hypothesis. For announcements where the target's status is public, there is a weak indication of a muted volume response, when comparing Fridays to the average of all other weekdays. Also here, most of the muted effect seems to be attributable to day +1, where the Friday – non-Friday differential value is negative and statistically significant at the 10 % level. This suggests that the strongest effect for the muted market reaction in regard to trading volumes and public targets, is realized during the next trading day, in most cases Monday.

There are some differences in the methods I use to study abnormal trading volumes to those of Louis and Sun (2010). These can provide some explanation to our varying results. One difference is the way they have calculated daily abnormal trading volumes. This is defined, as the difference between the log of the market value of shares traded on the day of interest (e.g day 0), and the average log of the market value of shares traded, during the same weekday, and over the previous 4 weeks before the merger announcement date. I.e. they match the announcement weekdays' trading volumes with the average trading volumes for the same

weekday over the 4-week period prior to the announcement. Thus, the benchmark log volume is not the same for all merger announcements and varies from the one I have used.

Another difference is that I calculate abnormal trading volumes over days 0 and +1, as the average of the abnormal trading volume during these two days (defined in Hirshleifer, Lim, and Teoh (2009)). Louis and Sun (2010) compute cumulative abnormal trading volumes as the sum of abnormal trading volumes over the two days (0, +1). This can also explain some of the variations in results. One could argue however, that if a slight change in methods produces weaker results, the prior results are not very robust. Yet, it should be remembered that my sample size is smaller to that of Louis and Sun (2010).

The differences in results presents some questions. For example, are the omitted observations in my sample, driving the results of Louis and Sun (2010)? My sample size is smaller compared to theirs. I.e. it is for the most part a subsample of theirs. I cannot seem to derive as robust results as they have, especially, the direction and magnitude of results, in the case of the acquirers' abnormal trading volumes for stock swaps involving privately owned targets. This implies that the Friday merger announcement effect might not be as strong as prior research suggests.

One could also consider, whether my data gathering and methodologies have been robust enough. For the most part, the directions of the results are consistent with Louis and Sun (2010), the magnitudes differ however. Thus, I doubt I have made some grave errors in regard to these parts.

## 5.5 Multivariate analysis

Some of the variation in the results between my univariate and multivariate tests, can be attributable to the omission of observations, with missing acquirers' book values of equity. Thus, the difference in sample size, stems from the variable *bm*. In total 259 observations are omitted from the multivariate tests. 82 when target status is private, and 177 when target status is private. Also, my univariate t-tests for differences in means assume unequal variances, although assuming equal variances does not materially change the results.

Table 13: Multivariate regression analysis for stock swap announcements and acquirers' cumulative abnormal returns (CAR) over days 0 and +1

$$CAR_i = \beta_0 + \beta_1 \text{highnews} + \beta_2 \text{friday} + \beta_3 \text{lnsize} + \beta_4 \text{relnsize} + \beta_5 \text{bm} + \varepsilon_i$$

	Stock swaps involving privately owned targets (N = 1222)	Stock swaps involving publicly owned targets (N = 1352)
intercept	0.0313 [2.48**]	-0.0063 [-0.68]
highnews	-0.0145 [-1.81*]	-0.0015 [-0.27]
friday	-0.0224 [-3.09***]	0.0092 [1.72*]
lnsize	-0.0021 [-1.29]	-0.0020 [-1.92*]
relnsize	0.0484 [4.48***]	-0.0179 [-3.96***]
bm	-0.0133 [-1.68*]	0.0153 [2.85***]

The intercept in the multivariate regression corresponds to the average acquirer cumulative abnormal return when announcing stock swap deals on non-high-news days and non-Fridays. CAR, the dependent variable, is the cumulative abnormal return over days 0 and +1 after the merger announcement. *highnews* is a binary variable taking 1 if the merger announcement is made on a high-news day, 0 otherwise. *friday* is a binary variable taking 1 if the merger announcement is made on a Friday, 0 otherwise. *lnsize* is the natural logarithm of acquirer's market value of equity 20 days prior to the announcement. *relnsize* is the ratio of the transaction's total value to the acquirer's market value of equity 20 days prior to the merger announcement; *bm* is the acquirer's book-to-market value of equity at the end of the quarter prior to the merger announcement. The t-values are presented in square brackets.

My multivariate regression results for the acquirers' cumulative abnormal returns, over the two days (0, +1) after the merger announcement, are similar to the results Louis and Sun (2010) obtain. Fridays exhibit a muted price reaction, when the target's status is both private and public. I.e. the acquirers' cumulative abnormal returns, are on average, less negative when the target's status is private, and less positive when the target's status is public. This relates to prior research, reporting that, on average, the market reacts positively (negatively) to stock swap announcements of privately (publicly) owned firms (Chang (1998); Fuller, Netter, and Stegemoller (2002); Moeller, Schlingemann, and Stulz (2005); Louis (2005); Gong, Louis, and Sun (2008)). The effect seems to be more pronounced for private targets. This holds, after controlling for the variables *highnews*, *lnsize*, *relsize* and *bm*.

As covered before, Fridays are very seldom categorized as high-news days in my sample. For the multivariate sample, and stock swaps involving privately owned targets, this occurs only for 7 out of 1 222 observations, 0.57 %. Respectively, when the target's status is public the figure is even lower, 2 out of 1 352 observations, 0.15 %. Conversely, 29 out of 1 222 (2.4 %) and 27 out of 1 352 (2.0 %) of Friday observations are categorized as low-news days, when the target's status is private and public.

According to Louis and Sun (2010), compared to other days, the acquirer's market value of equity tends to be higher for Friday stock swap announcements (differential not statistically significant). Respectively, the relative size of the total transaction value to the acquirer's market value tends to be lower for Friday announcers (differential not statistically significant). Book-to-market value of equity tends to be higher (differential statistically significant).

Merger announcements on high-news days exhibit similar effects to those reported in the univariate tests. Compared to the univariate tests, the t-value for announcement effects in stock swaps involving privately owned targets increases (more negative), after including the control variables. There seems to be a muted price reaction for the acquirers when the mergers involve private targets. My results for stock swaps involving publicly owned targets, show a negative, however not significant coefficient. This does not support the muted price response for acquirers announcing mergers on high-news days, in the same fashion that the results from my univariate tests suggest.

The coefficient for *lnsize* is negative, when the target's status is both private and public. I.e. when announcing stock-for-stock mergers, the acquirers' cumulative abnormal returns around the event window (0,+1) are negatively affected, with increasing bidders' total market value of

equity. For stock swaps involving publicly owned targets, the coefficient for *lnsize* differs from the findings of Louis and Sun (2010), as they report a positive, however statistically insignificant coefficient (*LSIZE*).

The coefficient for *relsize* is positive when the target's status is private and negative for stock swaps involving publicly owned targets. This suggests that, in the case of public targets, the acquirers' announcement period cumulative abnormal returns are negatively affected, when the relative size of the transaction increases. The opposite seems to hold when the target's status is private. Both coefficients are statistically significant at the 1 % level.

Some prior research has been conducted on the topic. Scanlon et al. (1989) study the relative size of mergers and the impact they have on stock returns of the acquiring companies. The authors report that purchases of relatively large companies affect acquiring firms' returns significantly more negative, when comparing with the rest of their sample. In their study, both acquiring and acquired firms are publicly traded. Louis (2004b) reports a statistically significant negative coefficient for relative size in regard to announcements of bank mergers. According to (Louis 2004a), the negative coefficient can be explained by smaller targets being more manageable (Chatterjee (1986)), and relatively large targets having a noticeable effect on acquirers' stock returns.

My results indicate a negative (positive) coefficient for *bm*, when the target's status is private (public). Both values are statistically significant, but the effect is more pronounced for acquirers' of publicly owned targets (1 % level significance). Thus, increases in acquirers' book-to-market ratio seems to affect their cumulative abnormal returns negatively (positively) when announcing stock swap deals of privately (publicly) owned targets.

Lang et al. (1989) report that acquirers with high Tobin's q ratios exhibit significant positive abnormal return differentials compared to those with low q ratios, in successful tender offers during the time period 1968-1980. On average, bidders with low q ratios show negative abnormal returns. Their sample includes observations where both the target and bidder are publicly listed firms. Specifically, high q bidders of low q targets, show positive and statistically significant results compared to low q bidders of high q targets (Lang et al. (1989)). According to the authors this can be explained by the market rewarding well managed firms taking over poorly managed firms. On average, their results indicate that announcement period returns are negative for low q acquirers of high q targets. Low q bidder/low q target and high q bidder/high q target exhibit positive, but not statistically significant coefficients to the negative intercept



term corresponding to low  $q$  bidder/high  $q$  target. Servaes (1991) extends the analysis of Lang et al. (1989) to cover both mergers and tender offers during the time period 1972-1987. The author reports similar results, i.e. that acquirers' returns are on average larger, when acquirer (target)  $q$  ratio is higher (lower).

Rau and Vermaelen (1998) report that the market is prone to overestimate the capabilities of low book-to-market (glamour) firms in managing acquisitions, based on overextrapolation of bidders' past performance. Conversely, the market tends to be too pessimistic about the capabilities of high book-to-market (value) firms' capabilities in managing acquisitions (Rau and Vermaelen (1998)). Managers of glamour firms also seem to be more prone to hubris in their expectations to manage acquisitions. Thus, they may not make as smart acquisitions as value firms, with higher scrutiny regarding managerial decisions and tighter constraints. In the long-run glamour acquirers seem to underperform compared to value acquirers. However, in the short-run glamour bidders returns seem to be much larger than value bidders around the announcement date.

Based on my results for the coefficients of  $bm$ , I cannot verify the earlier findings. Tobin's  $q$  ratio, is defined as total market value of firm divided by total asset value (replacement cost)<sup>17</sup>, similar to the price-to-book ratio – the inverse of book-to-market. Thus, I see an opposite effect for stock swap announcements, when the target's status is public. The earlier findings are consistent with what I see, when target status is private. Perhaps the pattern I observe for  $bm$  in my multivariate analysis of CAR, is that the market reacts negatively to stock swap announcements involving publicly owned targets, when mergers are driven by acquirers' overvalued equity. I.e. the use of stock in the merger can signal that the share price of the acquirer is overvalued.

Shleifer and Vishny (2003) propose that overvalued bidders, who expect to see negative stock returns in the long-run, can use stock acquisitions in an attempt to make these returns less negative. Overvalued acquirers will also use stock as a means of payment in transactions, where the target is relatively less overvalued. Overall, cash (stock) acquisitions tend to exhibit positive (negative) long-run abnormal returns for acquirers, when the method of payment is considered (see e.g. Servaes (1991), Loughran and Vijh (1997)).

The model of Shleifer and Vishny (2003) yields some interesting predictions overall. According to the authors, the proportion of stock acquisitions increases, when aggregate or industry

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<sup>17</sup> See e.g. <http://www.investopedia.com/terms/q/qratio.asp>

valuations are high, and with dispersion in valuations among firms. Despite underperforming compared to cash acquisitions, and negative long-run stock performance of acquirers, stock acquisitions can serve the interest of acquirers' long-run shareholders. In stock acquisitions, bidders likely exhibit high prior returns to the announcement, and signs of overvaluation. Shleifer and Vishny's (2003) model presumes that financial markets are inefficient, while managers are completely rational. In the authors' words, "managers rationally respond to less-than-rational markets" (Shleifer and Vishny (2003, p. 297)

My results for  $bm$  could be explained, by the market being more efficient than that proposed in Shleifer and Vishny (2003). Overextrapolation of past results can lead to higher valuations of bidders, but when they announce a stock swap acquisition of a public target, they signal that it is optimal for the acquirer to use equity as a means of payment, even if the share price drops in the short-term. The expected long-run drop of the acquirer's share price (from the firms' point of view), could have been larger. I.e. my results for the association between CAR and  $bm$ , when the target's status is public, could be explained by the market learning something from the corporate decision (Myers and Majluf (1984)).

Perhaps markets are in some ways inefficient up until the stock swap merger announcement, but the investors realize that the firms' equity is likely overvalued when the announcement is released. Thus, the constant for the multivariate regression should be negative, and the coefficient of  $bm$  positive. For example, it has been reported that stock-for-stock acquirers show signs of overvaluation, such as earnings manipulation and insider selling, prior to the announcement (Shleifer and Vishny (2003)). See also Erickson and Wang (1999; Jenter (2002)). Correcting for possible earnings manipulation can be hard for investors, at least ex ante the firm signals something through a decision, or it is revealed that earnings have been manipulated. Also, Loughran and Ritter (1995) suggest that firms may take advantage of conditions by issuing equity when it is overvalued (IPOs, SEOs). The coefficient for  $bm$ , in the case of public bidders acquiring firms that are privately owned is negative (significant at the 10 % level). If the explanation for acquirers' abnormal returns, is as I have hypothesized above, then why should the case be different here? After all, in both cases the acquirers are publicly traded firms. This question is hard to answer.

Table 14: Multivariate regression analysis for stock swap announcements and acquirers' abnormal trading volumes (ATV) over days 0 and +1

$$ATV_i = \beta_0 + \beta_1 \text{highnews} + \beta_2 \text{friday} + \beta_3 \text{lnsize} + \beta_4 \text{relnsize} + \beta_5 \text{bm} + \varepsilon_i$$

	Stock swaps involving privately owned targets (N = 1222)	Stock swaps involving publicly owned targets (N = 1352)
intercept	0.1717 [2.29**]	0.4081 [5.83***]
highnews	0.0855 [1.80*]	-0.1147 [-2.77***]
friday	0.0127 [0.29]	-0.0786 [-1.94*]
lnsize	-0.0157 [-1.65*]	-0.0182 [-2.26**]
relnsize	0.5158 [8.03***]	0.4092 [11.97***]
bm	0.0544 [1.16]	-0.0072 [-0.18]

The intercept in the multivariate regression corresponds to the average acquirer abnormal trading volume when announcing stock swap deals on non-high-news days and non-Fridays. ATV, the dependent variable, is the abnormal trading volume over days 0 and +1 after the merger announcement. For the descriptions of other variable, see Table 13. The t-values are presented in square brackets.

After controlling for other determinants, the t-values of *highnews* are close to those shown in my univariate tests. When the target's status is private, the difference in the constant is slightly more positive (1,80>1,70) and statistically significant at the 10 % level. This does not support the hypothesis of a muted market reaction in regard to abnormal trading volumes on high-news days. The results indicate that acquirers' average abnormal trading volume is larger on high-news days.

When the target's status is public the difference in the constant is slightly less negative (-2,77>-3,19), yet statistically significant at the 1 % level. Thus, after controlling for other variables, the results are similar to those I obtain in my univariate tests. Also *friday*, exhibits similar results to the ones I show in my univariate tests. However, the significance of the Friday effect seems to have increased, when the target's status is public (-1,94<-1,24), now significant at the 10 % level. When the target's status is private, the coefficient is still insignificant (0,29<0,56).

*Lsize* has negative coefficient, when the target's status is both private and public, and statistically significant at the 10 % and 5 % levels. Thus, when the acquirer's market value of equity increases, abnormal trading volumes decrease. This seems intuitive. The coefficients for *relsize* are positive, for announcements involving both privately and publicly owned targets, and statistically significant at the 1 % level. When the relative size of the transactions increase, abnormal trading volumes increase. The coefficients for *bm* are not statistically significant.

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Table 15: Multivariate regression analysis for stock swap announcements and acquirers' abnormal trading volumes (ATV) over days 0 and +1

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$$ATV_i = \beta_0 + \beta_1 \text{highnews} + \beta_2 \text{friday} + \beta_3 \text{lsize} + \beta_4 \text{relsize} + \beta_5 \text{bm} + \varepsilon_i$$


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	All stock swaps involving privately and publicly owned targets (N = 2574)
intercept	0.2318 [4.76***]
highnews	-0.0199 [-0.64]
friday	-0.0298 [-1.01]
public	0.1356 [6.18***]
lsize	-0.0183 [-3,01***]
relsize	0.4368 [14,28***]
bm	0.0214 [0,69]

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The intercept in the multivariate regression corresponds to the average acquirer abnormal trading volume when announcing stock swap deals on non-high-news days and non-Fridays. ATV, the dependent variable, is the abnormal trading volume over days 0 and +1 after the merger announcement. *public* is a binary variable taking the value of 1 if target status is public, 0 otherwise. For the descriptions of other variable, see Table 13. The t-values are presented in square brackets.

For comparative purposes (Louis and Sun (2010)), I have also conducted a multivariate regression test, where all stock swap announcements are included, with the acquirers' abnormal trading volumes over day 0 and +1 as the dependent variable. The main takeaway here, is the statistically significant - at the 1 % level - coefficient for the variable *public*. This indicates that, on average, the acquirers' abnormal trading volumes increase significantly over days 0 and +1,

when announcing stock-for-stock mergers, where public companies are targets. This conclusion can indeed be derived from the earlier results. However, I have chosen to include it for additional clarification.

## 6. Discussion of the results

This section provides further discussion of the results and the implications they carry. Also, it raises some concerns, over the feasibility of using the daily number of earnings announcements as a proxy for investor distraction in the context of stock swap merger announcements.

A few interesting questions arise, in regard to the muted market reaction hypothesis for merger announcements on high-news days. Why are the high-news differentials in acquirers' average cumulative abnormal returns over days 0 and +1 significant, when the target's status is private, but not when the target's status is public? Why are the high-news differentials in acquirers' average abnormal trading volumes over days 0 and +1 significant, when the target's status is public, but not when the target's status is private? In fact, the positive abnormal trading volume differential for stock swap announcements involving privately owned targets, suggests that there is, on average, larger abnormal trading volume on high-news days.

Overall, I gain some support for the investor distraction hypothesis on high-news days. Those results that are statistically significant in the univariate tests, hold in the multivariate tests. My univariate t-tests for mean differences, assume unequal variances. However, assuming equal variance does not materially affect the univariate results.

My results for high-news day differentials, do not seem to be very robust on the whole. Also, when the target's status is private, the *highnews* positive difference in the constant for the acquirers' average abnormal trading volume still persists, after controlling for other variables. It is hard to rule out other unobserved determinants that could drive, help explain the results. Dispersion of opinions in regard to merger announcements, could explain some aspects of the results (DellaVigna and Pollet (2009)).

Moeller, Schlingemann, and Stulz (2007) report a negative correlation between public stock-for-stock acquirers' announcement abnormal returns, and proxies for information asymmetry and diversity of opinion. Specifically, this applies, when both acquirer and target status is public, and the medium of payment is equity. Idiosyncratic volatility is used as a proxy for information asymmetry. Respectively, the standard deviation of analyst forecasts and breadth of ownership are used as proxies for diversity of opinion. The authors report that public bidders' abnormal returns in stock-for-stock acquisitions of public companies decrease, when proxies for diversity of opinion increase. However, when idiosyncratic volatility is controlled for, the

proxies for diversity of opinion are not significant (Moeller, Schlingemann, and Stulz (2007)). Also, after controlling for idiosyncratic volatility, the authors find no difference in abnormal returns between stock-for-stock acquisitions of public and private firms. The authors do not find a negative relation between public acquirers' abnormal returns and diversity of opinion in stock swap acquisitions of private firms.

Louis and Sun (2010) control for the proportion of institutional ownership (breadth of ownership) and the standard deviation of analysts' long-term earnings forecasts (dispersion of opinion). The authors report a positive (significant at the 1 % level) correlation between the proportion of institutional ownership and abnormal trading volumes, when both public and private targets are included. Dispersion of opinion is negatively related to abnormal trading volumes, but not statistically significant in their tests.

In regard to abnormal returns, both of the variables do not show statistically significant results when the target's status is private. When the target's status is public, the authors report negative and statistically significant values for both proportion of institutional ownership and diversity of opinion (statistically significant at 5 % and 1 % level respectively). I have not controlled for these variables, so it is hard to provide a definite answer of their possible effects, if they were included in my multivariate tests. However, the prior research conducted, does not seem to support the notion, that the mixed results I get for the acquirers' stock swap announcement abnormal returns and trading volumes, could be explained by diversity of opinion, when private targets are involved.

To calculate abnormal trading volumes, the turnover approach is perhaps more used. I.e. trading volume (e.g. daily) divided by total shares outstanding. I have chosen to use the market value of shares traded approach, defined in equation (3), due to DellaVigna and Pollet (2009), Hirshleifer, Lim, and Teoh (2009), Louis and Sun (2010) using it. Using the turnover approach, could lead to some differences in results. However, the expectation is that it does not have a material effect.

To gain some further insight, it could be worthwhile to study the high-news, low-news status of the days prior to and after the announcement (-1 and +1). This could help explain, some of the patterns I observe in the univariate tests. Further, what are the effects on abnormal trading volumes and returns, when multiple mergers are announced during the same day? I have not controlled for these determinants in my study. In regard to same day mergers, the size of the sample could also drop considerably, which poses a problem.

Either have I controlled for the effects of earnings surprises. Earnings surprises can be expected to receive heightened investor scrutiny, compared to “normal”, “regular” earnings announcements. For one, they resemble more merger announcements, in the way that they are to a higher degree unexpected events. If multiple earnings surprises occur during the same day, this could lead to decreased investor attention, a higher level of investor distraction. Thus, controlling for these factors could provide further insight to the proposed investor distraction hypothesis on high-news days. Similarly, as the t-values for the Friday coefficient drop somewhat in my multivariate tests, these could be of interest when studying the Friday effect as well.

Since I for the most part, show similar yet less pronounced results for the Friday effect, as Louis and Sun (2010), I doubt I have made some errors in the collection of the data. However, also here, I cannot verify the hypothesized negative abnormal trading volume differential for Fridays. The omitted observations – likely to a large part those with CRSP share code 11 - in my sample, could explain the more pronounced and consistent results shown in Louis and Sun (2010). These observations can also be driving their results. Thus, it raises the question, whether their results are robust enough and hold for a subsample of their data? What possible other unobserved determinants might drive the differences in our results?

There is an interesting new forthcoming paper by Michaely, Rubin, and Vedrashko (2015, forthcoming), suggesting that the observed muted market reaction effects on Fridays, to various corporate events and announcements, including mergers, are due to selection bias. According to the authors, firms that conduct Friday announcements have experienced muted market responses during other weekdays also, and seem to share common unobserved characteristics in regard to the type of announcement. I.e. common firm-specific characteristics across announcement types. Also, Shevlin and Thornock (2015) do not find support for reduced investor attention on Fridays, when studying releases of earnings announcements.

After correcting for the selection bias, Michaely, Rubin, and Vedrashko (2015, forthcoming) find no support to the notion that investors are less attentive to corporate announcements during Fridays, compared to other weekdays. If their results hold, this could explain some aspects to the mixed results I receive, in regard to the hypothesized Friday effect. However, this does not provide further clarification on my mixed results in regard to the hypothesized investor distraction effect on high-news days.



Perhaps merger announcements, are in itself, such noteworthy news that a high-amount of distracting earnings news occurring on the same day, does not significantly draw attention away from the main headline, if you will. To gain support for the investor distraction hypothesis, (proxied by the amount of daily earnings announcements) in the context of merger announcements, my results should likely show a muted market response for both acquirers' abnormal returns and trading volumes, and for transactions that involve both publicly and privately owned targets. This is not case, and thus I cannot verify the *investor distraction* hypothesis (Hirshleifer, Lim, and Teoh (2009)), on the whole, in the context of merger announcements. At the least, the analysis should be extended to include other proposed control variables. Further, to gain some insight about possible differences in long-run performance, abnormal performance could be calculated for e.g. the post-announcement window (2, 61).

Also, an important point to consider is what amount of same day earnings announcements start causing investor distraction. I.e. the investor distraction effect does not necessarily increase steadily. Thus, the question arises, whether the non-high-news days' group is a good control group? Investor distraction is presumably low during low-news days. Hirshleifer, Lim, and Teoh (2009) use the top and bottom deciles for the number of same day earnings announcements, and I have followed their approach. I decided to select the non-high-news days group, to see if there is variation in the differences between high-news day merger announcements and low-news days/non-high-news days. The analysis provides some robustness to the results, but mainly not in the hypothesized direction.

## 7. Summary and conclusions

Studying the possible muted market reaction to stock-for-stock merger announcements, I find partial evidence for this occurring on high-news days and Fridays. However, on the whole the results are not very robust, consistent over the whole sample, and in regard to both differential abnormal returns and trading volumes. As DellaVigna and Pollet (2009) note, if the muted price reaction (in their study, Friday and earnings announcements) is attributable to *investor distraction*, a muted volume reaction is also expected. Based on my results, I cannot consistently verify this. In the model of DellaVigna and Pollet (2009), if the muted price reaction is attributable to a higher degree in dispersion of opinion, larger abnormal trading volumes would be expected (on Fridays in their study).

Summary in regard to the differential market reaction, between high-news days and low-news days/non-high-news days:

Over days 0 and +1 around the announcement, and in regard to differential abnormal returns, I gain support for Hypothesis 1 (at the 10 % significance level), but not for Hypothesis 2. As for abnormal trading volumes, I gain support for Hypothesis 4 (1 % significance level), but not for Hypothesis 3. In fact, my results related to Hypothesis 3 are in the opposite direction of what is expected, and statistically significant at the 10 % level. These results remain after controlling for size, relative size, and book-to-market in my multivariate tests.

Additionally, the differences in mean abnormal returns and trading volumes, between high-news days and low-news days, and between high-news days and non-high-news days, do not show a consistent pattern in line with the *investor distraction* hypothesis. In some cases, the statistically significant differential market reactions occur during day +1 after the merger announcement. Thus, this does not robustly support the expectation of a muted market reaction on day 0, i.e. a high distraction day, proxied by the daily number of earnings announcements.

Summary in regard to the differential market reaction, between Fridays and non-Fridays:

Over the two-day window around the announcement (days 0 and +1), differences in mean abnormal returns provide support for Hypotheses 5 and 6 - statistically significant at 1 % and 10 % level. In regard to differences in abnormal trading volumes, I gain slight support for Hypothesis 8, but not for Hypothesis 7. Overall the results are similar after controlling for additional variables in my multivariate tests. Here, the results in regard to Hypothesis 8, become

statistically significant at the 10 % level. Also, with regard to the Friday muted effect, it is of concern that in some cases the statistically significant differentials seem to occur on day +1 after the merger announcement.

The main contribution of this study, to the existing literature, is that the daily number of earnings announcements might not be a very good proxy for investor distraction, in the context of merger announcements. I do receive partial support for my hypotheses, but to gain further insight on the matter the analysis should be extended. Also, it raises some questions over the robustness of the results that Louis and Sun (2010) report. As Shevlin and Thornock (2015), and Michaely, Rubin, and Vadrashko (2015, forthcoming) present, the proposed muted market response to Friday announcements, is still under debate. For future studies, it could be worthwhile to consider including some of the factors mentioned in Section 6. This would shed more light on the topic of limited investor attention and its role in regard to one of the largest corporate announcements, namely stock swap merger announcements.

## Appendix 1

Figure 2: Yearly distribution for stock swaps involving all targets 1994-2014

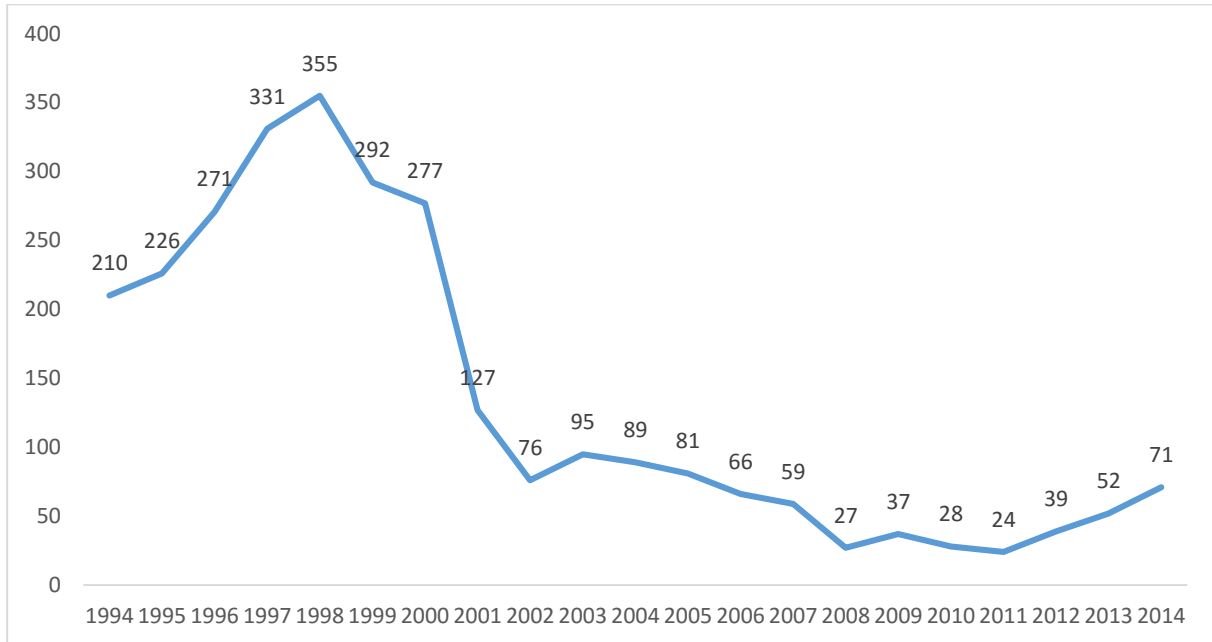


Figure 3: Yearly distribution for stock swaps involving publicly owned targets 1994-2014

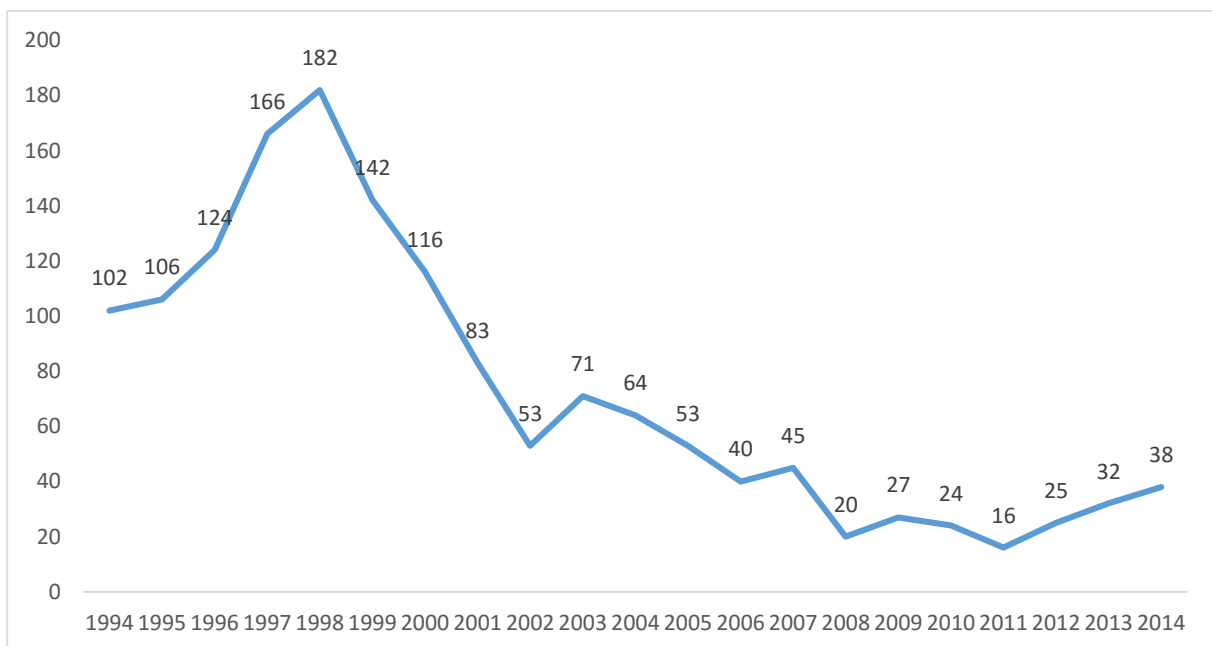
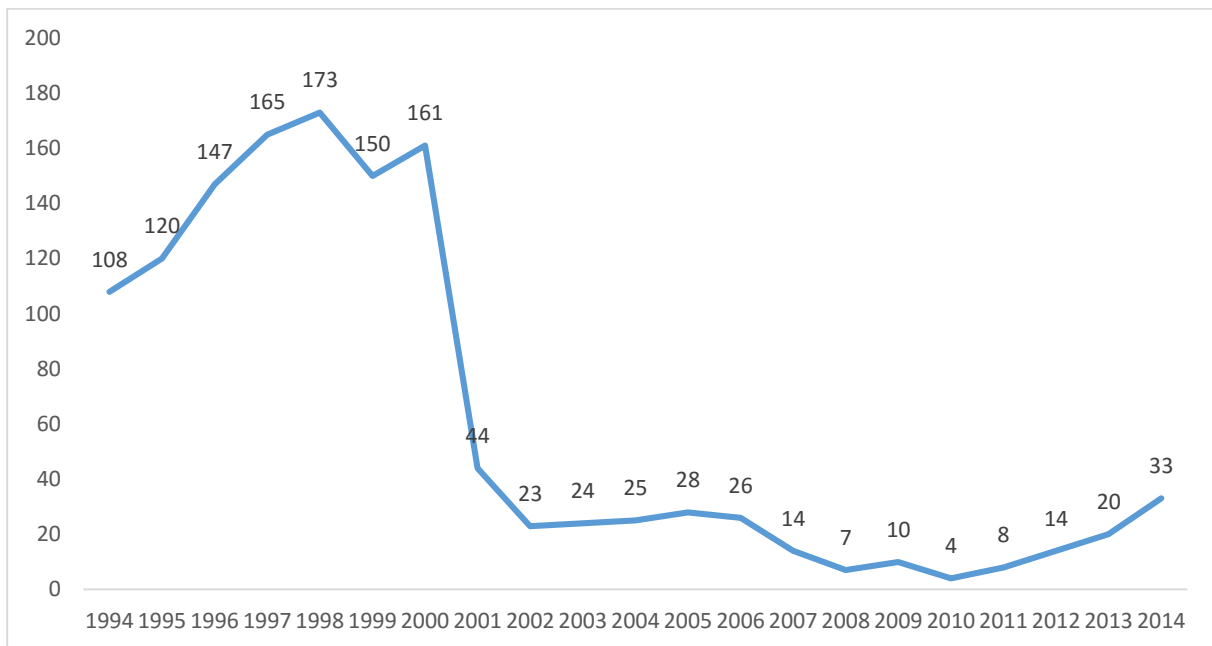


Figure 4: Yearly distribution for stock swaps involving privately owned targets 1994-2014



## Appendix 2

Table 16: Daily distribution of the merger announcement sample 1994-2006					
Panel A: Distribution for public targets (N = 1 302)					
	Announcement day				
	Monday	Tuesday	Wednesday	Thursday	Friday
Number of observations	384	266	241	232	179
Percentage of the sample	29.49 %	20.43 %	18.51 %	17.82 %	13.75 %
Panel B: Distribution for private targets (N = 1 194)					
	Announcement day				
	Monday	Tuesday	Wednesday	Thursday	Friday
Number of observations	261	287	232	229	185
Percentage of the sample	21.86 %	24.04 %	19.43 %	19.18 %	15.49 %
Panel C: Distribution for all targets (N = 2 496)					
	Announcement day				
	Monday	Tuesday	Wednesday	Thursday	Friday
Number of observations	645	553	473	461	364
Percentage of the sample	25.84 %	22.16 %	18.95 %	18.47 %	14.58 %

## Appendix 3

Table 17: Daily distribution of the merger announcement sample 2007-2014					
Panel A: Distribution for public targets (N = 227)					
	Announcement day				
	Monday	Tuesday	Wednesday	Thursday	Friday
Number of observations	70	42	43	45	27
Percentage of the sample	30.84 %	18.50 %	18.94 %	19.82 %	11.89 %
Panel B: Distribution for private targets (N = 110)					
	Announcement day				
	Monday	Tuesday	Wednesday	Thursday	Friday
Number of observations	31	21	20	26	12
Percentage of the sample	28.18 %	19.09 %	18.18 %	23.64 %	10.91 %
Panel C: Distribution for all targets (N = 337)					
	Announcement day				
	Monday	Tuesday	Wednesday	Thursday	Friday
Number of observations	101	63	63	71	39
Percentage of the sample	29.97 %	18.69 %	18.69 %	21.07 %	11.57 %

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