THE EFFECT OF TIMELINESS OF FINANCIAL DISCLOSURE ON POST-ANNOUNCEMENT ABNORMAL RETURNS

Dion Kieruj
680889
Master Accounting

Supervisor: Prof. Dr. A. De Waegenaere
THE EFFECT OF TIMELINESS OF FINANCIAL DISCLOSURE ON POST-ANNOUNCEMENT ABNORMAL RETURNS

Master thesis Department Accountancy

Dion Kieruj
680889

Supervisor: Prof. Dr. A. De Waegenaere
Second reader: Dr. S. Hollander

Company supervisor: Dhr. Thijs Jacobs (Ernst & Young)

Date of completion: 08-08-2013
SUMMARY:

This study examines how timeliness of disclosure of financial information affects the stock price reaction around earnings announcements. This is important for academic researchers who seek understanding of the effects of timeliness, while managers can use the results to make cost-benefit analyses when making decisions about disclosure timing. The hypotheses are tested on two samples. One contains only good news announcements, while the other only contains bad news announcements. The samples consist of S&P 500 companies and data about these companies is from the years 2010 and 2011. The effect of reporting lag is tested using a regression analysis, while controlling for unexpected earnings, firm size, systematic risk (beta), debt-to-equity ratio and conservatism (market-to-book ratio). Results indicate that timeliness of earnings announcements affects the stock price reaction if the news is bad, but not when it is good. Also, the magnitude of bad news is not relevant when predicting stock returns, but the magnitude of good news is. The observed effects are very small, and the model explains only a low percentage of the total variance in abnormal returns. The results are robust when measuring abnormal returns using the market adjusted returns and the market model. Further research is necessary to see whether the cumulative stock return in the period leading to the earnings announcement and shortly after the earnings announcement is affected by timeliness of financial disclosure.
I. INTRODUCTION

Because the shares of listed companies are publicly traded, these firms are required by law to make their financial statements available to the public. This makes it easier for investors to estimate the value of the shares and to make informed investment decisions. Firms have some discretion when deciding on the timing of these disclosures. There are costs and benefits to delaying earnings announcements. Examples of benefits include additional time to come up with a plan to improve in the next period, contract negotiations and earnings management. Costs associated with delaying news announcements are primarily litigation risk and reputation costs. This means that managers need to make a cost-benefit analysis when deciding on the timing of disclosure. In this study, focus lies on how the timing of these earnings announcements affects the stock price reaction at the time of the announcement, because the stock price reaction should be taken into account in the decision making process.

The authors of the existing literature on this subject have come to different conclusions. Givoly & Palmon (1982) find that the stock price reaction becomes smaller as the reporting lag grows, because more information about the firm’s earnings number becomes available through alternative channels. This information is then compounded in the company’s stock price, which leads to a smaller reaction at the time of the announcement. This reasoning is consistent with Bagnoli et. al (2002), who find that announcements that occur earlier than expected are met with larger stock price reactions. In other words, the relevance of an earnings announcement declines if a company chooses a later date to report. In contrast, Chambers & Penman (1984) find that late bad news announcements lead to larger stock price declines than early bad news announcements. This suggests that investors are not capable of fully anticipating the news content of a delayed report.

To test how investors react to the timing of an earnings announcement, the total sample of 932 observations from the years 2010 and 2011 is divided into a good news (683 observations) and a bad news (249 observations) sample. In the good news and bad news samples, all earnings announcements contain positive and negative unexpected earnings, respectively. The proxy for expected earnings is the consensus analyst forecast. The assumption is that investors base their expectations on these forecasts. Unexpected earnings
are then calculated by contracting expected earnings from reported earnings. So the good news sample represents the announcements that exceeded investors’ expectations, and the bad news sample contains the announcements that were worse than expected.

Because the results from previous literature are mixed, the hypotheses that are tested in this study are non-directional. The model used to test the hypotheses is based on a model used in Easton & Zmijewski (1989) and is adjusted to include the timeliness of earnings announcements (measured by the number of days between the end of the fiscal quarter to the report date). First, descriptive statistics and a t-test point out the main differences between the good news and bad news samples. The good news sample has a positive mean abnormal return, and the bad news sample has a negative mean abnormal return. This means that, on average, investors react to bad news by adjusting the share price downwards, while the shares become more valuable if good news is announced. Also, the reporting lag is 1 day longer on average if the news is bad, consistent with the bad news late, good news early results found in prior literature (Bagnoli et. al (2002), Begley & Fischer (1998), Givoly & Palmon (1982), Chambers & Penman (1982) and Sengupta (2004)). The results of the regression analysis indicate that a higher reporting lag leads to a smaller stock price decline if the announcement contains bad news. The effect of reporting lag is not present in case of good news announcements. The effect of unexpected earnings is significant in the good news sample, but not in the bad news sample. This suggests that the magnitude of the bad news is not important for investors, but the share price does rise more if the company reports bigger positive unexpected earnings. Also, firm size seems to be an important factor in predicting stock returns. Specifically, larger firms have less volatile stock returns. The results lead to a rejection of one of the two hypotheses.

The results of this study have implications for both academic researchers and for managers who are tasked with decision making regarding disclosure timing. The finding that reporting lag has a small, yet significant effect on the abnormal return around the announcement date if there is bad news to report, is very relevant for managers who supposedly make a cost-benefit analysis when deciding on disclosure timing. The result that the magnitude of bad news does not have a significant effect on the abnormal return is relevant for both academic researchers studying value relevance of earnings and for managers who have bad news to disclose.
II. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

II.1 Value relevance of earnings

Companies whose shares are publicly traded have the obligation to make their earnings numbers publicly available. Shareholders and other investors rely on the information contained in corporate disclosures to make informed investment decisions. Companies use different types of disclosures to make relevant information available to the public: annual reports, quarterly reports and other disclosures related to significant events (CEO changes, considerable impairment write-offs, etc.). In this paper, the focus lies on disclosures of earnings included in quarterly reports.

If investors rely on earnings announcements to make informed investment decisions, then that would indicate that accounting income numbers contain relevant information. This so-called ‘value relevance’ of accounting earnings has been studied in the late sixties by Ball & Brown (1968) and Beaver (1968). Results of these studies indicate that earnings announcements do in fact contain relevant information. Ball & Brown (1968) find that about half of all the information about a firm that becomes available during the year is captured in that year’s income number. This means that only half of the information that the earnings number captures can be considered new information. Beaver (1968) comes to the similar conclusion that other news announcements do not entirely preempt the information content of earnings announcements, because stock prices do react significantly around the report date.

Possible sources of information other than the company’s earnings announcements are dividend announcements, analyst forecasts and management earnings forecasts, but also earnings announcements by other companies in the same industry. The results from Foster (1981) suggest that an earnings announcement by one company can heavily influence the stock price of the other, if both companies are in the same industry.

It is important to note that both Ball & Brown (1968) and Beaver (1968) look at annual earnings numbers. Further research in the value relevance literature suggests that earnings reported in quarterly reports are at least 30% more useful to predict stock returns than annual earnings announcements (Brown & Kennely, 1972). This implies that quarterly earnings announcements contain more new information than annual earnings announcements. A
possible reason for this is that investors have less time to form accurate expectations (and less
time to receive information from other sources) about quarterly EPS numbers compared to
annual EPS numbers. However, the findings of May (1971) are not consistent with Brown &
Kennely (1972). May (1971) expects that price reactions around quarterly reports will be
smaller than around annual reports, because quarterly reports are not audited and are thus
perceived as being of lower quality. The results of that same study however suggest that price
changes around a quarterly earnings report are approximately the same compared to the
period around annual reports. This would mean that investors do not perceive the quarterly
reports as being of lower quality and that they do not contain more new information (May,
1971).

All in all it is clear that investors value a company’s earnings announcements, but it is not the
only source of information that they use to make informed investment decisions. In the study
of Francis et. al (2002) the effect of analyst reports on the usefulness of earnings
announcement is investigated. They hypothesize that analysts following a company and the
company itself are competing sources of information and that analyst reports are substitutes
for earnings announcements. This means that when an analyst releases a forecast of the
company’s earnings, that the subsequent official earnings announcement loses some
relevance. If the announcement is less relevant, then the stock price reaction should be
smaller. Instead, Francis et. al (2002) find that the two sources of information actually
complement each other and that increased use of analyst reports does not erode the
informativeness of earnings announcements.

II.2 Timing of earnings announcements

Other than the content of the earnings report, the timing of the announcement also influences
investors’ reactions. The results from Givoly & Palmon (1982) suggest that late reports are
met with smaller share price reactions, because more of the information contained in the
report has become publicly available through other channels by the time it is announced. This
finding is consistent with the results from Bagnoli et. al (2002), who find that stock price
reactions to announcements that are earlier than expected are larger than reactions to on-time
or late announcements. If this is true, then good news reports that are announced earlier, are
met with bigger increases in stock price, while delaying bad news reports results in a smaller
stock price drop.
Another finding by Bagnoli et. al (2002) suggests that even though stock price movements due to investor’s reactions are smaller at the time of the earnings announcement when the reporting delay increases, abnormal returns for that firm do become more negative, regardless of good or bad earnings numbers. This would mean that investors anticipate bad news when companies report late. Consistent with the findings in Bagnoli et. al (2002), Begley & Fischer (1998) find that even though abnormal returns become more negative as the reporting lag grows, most late reporting firms experience a higher than expected negative return after the announce date. This suggests that investors only partially anticipate the bad news when the earnings report is later than expected.

Chambers & Penman (1984) performed a similar study where they tested to see whether the timing of earnings announcements had an effect on the abnormal returns of a company and whether the direction of the news could be derived from the announcement timing. They found that late reports tend to contain bad news, while early reports mostly contain good news. More evidence for the ‘good news early, bad news late’ hypothesis is found in Patell & Wolfson (1982), Begley & Fischer (1998), Bagnoli et. al (2002), Sengupta (2004), Givoly & Palmon (1982). Another interesting finding was that early bad news reports and late good news reports were not followed by abnormal changes in the company’s stock price, while late bad news and early good news reports caused substantial stock price decreases and increases, respectively. This finding suggests that managers should disclose earnings news (both good and bad) early, to achieve the most favorable stock price returns.

There are several reasons for earnings announcements to be delayed. According to Begley & Fischer (1998), managers who are in the process of completing contract negotiations benefit from delaying bad news announcements, because the terms of the contract will be less favorable if the bad news is known. Also, by delaying bad news announcements management has more time to prepare explanations for the results and to come up with a plan to reverse the bad performance to ease investors’ minds. Another benefit of delaying bad news announcements is the possibility of managing earnings, which can be a time consuming process. Apart from managerial incentives to delay earnings announcements, there are also several explanations of a different nature. Bagnoli et. al (2002), Sengupta (2004), and Givoly & Palmon (1982) all mention accounting and audit complexity as one of the determinants of reporting delay. When a firm has a high accounting complexity, the length of the audit increases, which leads to a longer reporting lag. Aside from accounting complexity, bad
financial performance can also influence audit length. If a company performs poorly, then those companies will likely require more lengthy audits (Patell & Wolfson, 1982). Also, Doyle & Magilke (2009) found evidence that managers have more benign motives for delaying earnings announcements. In a study where they investigated whether firms who switch from reporting before the market opens to after the market closes do this to reduce the exposure and negative effects of bad news announcements, they find no evidence to support that hypothesis. They even conclude that instead of timing disclosures opportunistically, companies switch to an after the market closes disclosure policy to give the market more time to assimilate the bad news.

Just because there are reasons for managers to delay the disclosure of bad news, does not mean that it is always the best option. If the company has bad news to report, a manager needs to make a cost-benefit analysis. If the costs of disclosing the news early exceed the benefits, then he will delay the news announcement for as long as possible. There are however several reasons why disclosing bad news early can be beneficial. According to Skinner (1994), a manager’s (or company’s) reputation might be severely damaged if he failed to disclose negative earnings news in a timely manner. Another incentive that Skinner (1994) mentions is the litigation risk that the managers who are responsible for the timing face when bad news is not timely disclosed.

II. 3 Measuring timeliness

Accurately measuring timeliness of earnings announcements can be challenging. The most accurate measure would be the number of days between the time that management first became aware of the information and the date of the actual announcement. However, since data about the point in time that management first became aware of information is not disclosed, it is not possible to measure timeliness this way (Skinner, 1997). Skinner (1997) mentions three other ways to measure timeliness. The first way is to consider the form in which the news is disclosed. The different forms are: voluntary disclosure of earnings forecasts by management, a voluntary pre-announcement of earnings and a mandatory earnings announcement. The first form is considered the timeliest, while the last form is considered the least timely. The second way to measure timeliness according to Skinner (1997) is to calculate the number of trading days between the end of the reporting period and the report date. This measure is also used by Givoly & Palmon (1982), Annaert et. al (2002),
Sengupta (2004) and Chambers & Penman (1984). Then Skinner (1997) mentions a third method to measure timeliness by looking at a company’s own disclosure policy and comparing report dates to historical report dates. This so called ‘naïve’ measure is also used by Begley & Fischer (1998). Bagnoli et. al (2002) argue that all of the above methods are inaccurate and instead use the difference between the expected report dates that companies voluntarily disclosed to First Call (a Thomson Financial Services company) analysts and the report date. They find that these expected report dates are more accurate than the above mentioned extrapolative models: First Call expected report dates are correct 74% of the times, compared to 33% of the other models.

II.4 Corporate disclosure legislation

Companies listed on the New York Stock Exchange (NYSE) are required by law to file their quarterly and annual reports with the SEC within a certain time window and to make them available to shareholders on the same day. For annual reports, this time window is within 90 (non-accelerated filers), 75 (accelerated filers) or 60 days (large accelerated filers) after fiscal year end. For quarterly reports, the deadline is 45 (non-accelerated filers) or 40 days (accelerated filers) after the end of the quarter. Depending on the ‘public float’ (common equity held by non-affiliates), the company is classified as a non-accelerated filer, an accelerated filer or a large accelerated filer. This means that the larger a company’s public float, the earlier the financial statements have to be filed with the SEC (SEC Financial Reporting Manual, 2012). This indicates that the SEC deems timeliness of earnings announcements more important for bigger companies. An explanation for this can be found in Sengupta (2004), where the author concludes that companies with a large number of shareholders and higher trading volumes face greater information demand from investors. This means that investors require disclosures of financial information of large companies to be more informative and also timelier.

II.5 Hypotheses development

The prior literature mentioned earlier in this chapter does not always come to the same conclusion. For example, Chambers & Penman (1984) find that late disclosures contain bad news on average, but that the reactions from investors to later report dates are not significantly different from reactions to earlier announcements. However, Bagnoli et. al
find that investors react to delayed earnings announcements in the period up to the report date, and that they react further when the news is actually announced. This suggests that bad news is not fully anticipated in case of a delayed earnings announcement.

The results of Givoly & Palmon (1982) suggest that investors’ reactions to earnings announcements are smaller when bad news announcements are later than expected. This makes it interesting to investigate the matter further and to see whether making timely earnings announcements is preferable to delaying them. Because the results from prior literature are inconsistent, the following hypotheses are non-directional.

A possible result of this study would be that the later bad news is announced, the more information about earnings becomes available through alternative channels and the more investors will see the delay as a sign of bad news (Chambers & Penman, 1984). This would cause the stock price to decline during the time period until the earnings announcement. The actual announcement would then contain less new information than when the report date had been earlier. Because of this, the stock price reaction to the bad news announcement will be smaller.

However, it is also possible that investors do not sufficiently anticipate bad news when the earnings announcement is delayed and that information leakage is not as large a factor. This leads to the first non-directional hypothesis:

**H1**: The reporting lag of firms whose financial statements contain bad news is unrelated to the abnormal return around the announcement date.

Similar arguments can be made for good news announcements. One possibility is that investors anticipate bad news when the announcement is delayed, leading to a stock price decline up until the announcement date. However, if information contained in the good news report leaks out prior to the announcement date, then bad news anticipation should be neutralized. So when there is minimal information leakage, then the stock price increase around a good news announcement is going to be large, because investors were expecting the news to be bad. If a significant portion of information contained in the good news report is already known at the announcement date however, then the stock price effect should be minimal. This reasoning leads to the second non-directional hypothesis:
$H_2$: The reporting lag of firms whose financial statements contain good news is unrelated to the abnormal return around the announcement date.
III. RESEARCH DESIGN / METHOD

To test whether the timing of earnings announcements affects the way that investors react to the information contained in the report, the sample is divided into two parts. The first part contains observations where unexpected earnings are positive, while the second part only contains negative unexpected earnings. This way, good and bad news announcements are separated. The reason for this is that (if the results from Givoly & Palmon (1982) also apply to these samples) the relation between reporting lag and abnormal returns is expected to be negative when there is good news (stock price increase should be smaller when reporting lag is larger), and positive when there is bad news (stock price decrease should be smaller when reporting lag is larger). In other words, a large reporting lag could move abnormal returns towards zero, and this effect would not be visible if the sample contained both good and bad news announcements.

The regression model used in this paper is derived from Easton & Zmijewski (1989). The model used in that study attempts to measure the earnings response coefficient (ERC), which is the coefficient $C_i,1$ in the model below. The ERC measures the degree in which stock prices react to the reported earnings number in earnings announcements. The model is expressed as follows:

$$ AR_{i,t} = C_{i,0} + C_{i,1} UE_{i,t} + C_{i,2} REV_{i,t} + C_{i,3} BETA_{i,t} + C_{i,4} SIZE_{i,t} + \varepsilon $$

where:

- $AR_{i,t}$ = Abnormal return of company $i$ at time $t$ calculated by subtracting expected return from realized return.
- $UE_{i,t}$ = Unexpected earnings of company $i$ at time $t$ calculated by subtracting forecasted earnings from realized earnings.
- $REV_{i,t}$ = The revision in analysts’ forecasts of period $t+1$ following the earnings announcement of period $t$.
- $BETA_{i,t}$ = Systematic risk (beta) of firm $i$ in period $t$.
- $SIZE_{i,t}$ = The natural logarithm of firm $i$’s market capitalization in period $t$.
- $C_{i,0}, C_{i,1}$,
where:

- \( AR_{i,t} \) = Abnormal return of company \( i \) between the day before and two days after the earnings announcement (period \( t \)).
- \( UE_{i,f} \) = Unexpected earnings of company \( i \) for fiscal period \( f \).
- \( LAG_{i,f} \) = Reporting lag of company \( i \) in fiscal period \( f \).
- \( SIZE_{i,f} \) = Market value of company \( i \) at the time of the earnings announcement.
- \( DERATIO_{i,f} \) = The debt-to-equity ratio of company \( i \) at the time of the earnings announcement.
- \( BETA_{i,f} \) = Beta of company \( i \) at the time of the earnings announcement.
- \( MBRATIO_{i,f} \) = Market-to-book ratio of company \( i \) at the time of the earnings announcement.
- \( t \) = The time period of one day before the announcement to two days after the announcement.
\( f \) = Fiscal period (1, 2, 3 or 4).

\( \varepsilon \) = Random error.

These variables will be discussed in more detail in the next paragraphs.

**III.1 Dependent variable: Abnormal returns**

The dependent variable in this model is AR (Abnormal return). The proxy used for abnormal return used in this study is Market adjusted return. Market adjusted return is a measure of stock price deviation that corrects for the return of the market. This way, the stock price effect that is attributable to a specific company’s decision making and financial results can be estimated. The stock price effect is measured in period \( t \) (from one day before to two days after the earnings announcement). The period \( t \) is chosen to be 3 days in total, so that investors have sufficient time to process the new information. The abnormal return of company \( i \) in time period \( t \) is calculated in the same manner as in Bagnoli et al. (2002) and Begley & Fischer (1998), which is by subtracting the market return from the firm specific return in the same period:

\[
AR_{i,t} = \frac{R_{i,t}}{P_{i,z}} - \frac{MR_t}{MI_z}
\]

where:

\( AR_{i,t} \) = Abnormal return of company \( i \) in period \( t \).

\( R_{i,t} \) = Return of company \( i \) in period \( t \).

\( MR_t \) = Market return in period \( t \).

\( P_{i,z} \) = Stock price of company \( i \) at day \( z \).

\( MI_z \) = Market index at day \( z \).

\( z \) = The day before the earnings announcement.

\( t \) = The period of one day before the announcement to two days after the announcement.
III.2 Independent variable: Reporting lag

The independent variable and variable of primary interest in this study is LAG (Reporting lag), which measures the timeliness of earnings announcements. As previously mentioned, there are a number of methods to measure the timeliness of earnings announcements. According to Bagnoli et. al (2002), the best method would be to compare the report dates with First Call analyst expected report dates. However, since these expected report dates are not available, a different method is used. In this study, Reporting lag is measured by the number of days between the end of the fiscal period and the earnings announcement date, consistent with Givoly & Palmon (1982), Annaert et. al (2002), Sengupta (2004) and Chambers & Penman (1984). LAG for company \( i \) for fiscal period \( f \) is calculated as follows:

\[
LAG_{i,f} = RDATE_{i,f} - FENDDATE_{i,f}
\]

where:

- \( LAG_{i,f} \) = the number of days between company \( i \)'s fiscal period \( f \) end and company \( i \)'s report date of quarterly earnings.
- \( RDATE_{i,f} \) = company \( i \)'s report date of fiscal period \( f \) financial results.
- \( FENDDATE_{i,f} \) = the date on which fiscal period \( f \) ended for company \( i \).
- \( f \) = Fiscal period (1, 2, 3 or 4).

III.3 Control variables

Unexpected earnings

The first control variable in the regression model is the company’s quarterly UE (Unexpected earnings). This variable measures the difference between what a company was expected to earn and what it actually earned. The company’s expected earnings are measured by the average of analysts’ earnings forecasts \( FE_{i,f} \) that were made closest to (but not after) the earnings announcement. Forecasts used are made 13 days preceding the report date on average (see Appendix for a detailed analysis of the age of the forecasts), the maximum is 30 days before the announcement. If the company has positive unexpected earnings, then the company exceeded expectations (good news). If unexpected earnings are negative, then the
company performed worse than expected (bad news). UE of company $i$ for fiscal period $f$ is calculated as follows:

$$UE_{i,f} = E_{i,f} - FE_{i,f}$$

where:

- $UE_{i,f} = $ Unexpected earnings of company $i$ for fiscal period $f$.
- $E_{i,f} = $ EPS of company $i$ for fiscal period $f$.
- $FE_{i,f} = $ Forecasted EPS of company $i$ for fiscal period $f$.
- $f = $ Fiscal period (1, 2, 3 or 4)

**Firm Size**

The second control variable in the regression model is SIZE (firm size). Firm size is measured by the firm’s natural logarithm of market capitalization at the end of fiscal period $f$. Francis et al. (2002) find that the relation between firm size and stock price reaction to earnings announcements is significantly positive. In contrast, Atiase (1985) and Shores (1990) find a significantly negative relation. The results from these studies are not consistent, but they all document a significant relation between stock price reactions to earnings announcements and firm size, which is why SIZE is included in the regression model.

**Measures of risk**

The third control variable in the regression model is DERATIO (Debt-to-equity ratio), which is calculated by dividing a company’s total liabilities by its shareholders’ equity. This ratio is a measure of financial leverage and is used to determine an investment’s riskiness. A company with a high debt-to-equity ratio is likely to have more volatile earnings and is thus a more risky stock for investors to invest in. Another measure of risk in the regression model is BETA (Beta). A company’s Beta defines the volatility of its stock. If a company has a Beta equal to 1, then its returns will be perfectly correlated with the market return. If the Beta is bigger than 1, the correlation of the company’s stock price with the market return will be higher than 1. Similarly, if a company’s Beta is smaller than 1, the correlation of its stock price increase (decrease) will be smaller than 1.
The reason that these two measures of risk are included in the regression model is because risk is expected to have an effect on the investor reactions to corporate disclosure. Easton & Zmijewski (1989) and Landsman & Maydew (1999) find that the riskiness of a firm has a negative association with stock price reactions to earnings announcements. An explanation for this is that if a firm’s earnings are volatile, then current period earnings’ usefulness to predict future performance is lower than when earnings are more persistent. Because of this, the informativeness of the earnings announcement decreases, so it is expected that the stock price reaction will be smaller if a company’s risk is higher.

**Conservatism**

The last control variable in the regression model is the market-to-book ratio (MBRATIO). The market-to-book ratio has been used in prior literature (Givoly & Hayn (2000), Basu (1997)) as a proxy for conservatism. A company’s financial reporting is considered conservative if caution is exercised in regards to recognition of income and assets. A conservatively reporting entity generally requires a higher degree of certainty to recognize income increasing transactions than income decreasing transactions. This means that the assets and earnings figures in the financial statements of a conservatively reporting company are generally understated. This variable is included in the model, because the degree in which a company understates its assets and earnings is likely to have an effect on the way investors react to earnings announcements. The market-to-book ratio is calculated as follows:

\[ MBRATIO_{i,f} = \frac{VM_{i,f}}{VB_{i,f}} \]

where:

- \( MBRATIO_{i,f} \) = Market-to-book ratio of company \( i \) at fiscal period \( f \) end.
- \( VM_{i,f} \) = Market value of company \( i \) at fiscal period \( f \) end.
- \( VB_{i,f} \) = Book value of company \( i \) at fiscal period \( f \) end.

If a company recognizes decreases in assets and income more timely than increases, then its book value will decrease. Since book value is the denominator in the fraction, a decrease in book value will lead to an increase in the market-to-book ratio. The higher the market-to-book ratio, the more conservative the financial reporting of the company.
IV. SAMPLE SELECTION AND DATA

IV.1 Sample selection

The sample consists of US listed companies that are members of the Standard & Poor’s 500 (hereafter S&P 500). The S&P 500 is the stock market index based on the US listed companies with the largest market capitalization.

There are advantages and disadvantages of choosing the largest companies in the US. One very important advantage is the notion that bigger companies usually have a higher analyst following (Lang & Lundholm, 1996). This means that there are more individual analysts that predict future earnings of these companies, which should result in a more reliable consensus earnings forecast. If the consensus forecast is more accurate, then the measure of unexpected earnings used in this study is more powerful (Lang & Lundholm, 1996). Another advantage of using S&P 500 firms is the availability of data. These firms face a higher information demand from outside parties compared to smaller companies, so this makes it easier to collect all the necessary data to be used in the statistical analyses.

One disadvantage of choosing S&P 500 companies is the generalizability of the results. If the statistical tests in this study yield significant results, then they might not apply to smaller businesses. Also, if the variable SIZE turns out to have an insignificant effect, then the sample selection is a likely cause, because these companies are all quite large compared to companies outside of the sample.

IV.2 Data collection

The databases used to collect the data used in this study are COMPUSTAT, I/B/E/S and CRSP. Specifically, analyst earnings forecasts used to calculate unexpected earnings are retrieved from I/B/E/S, the daily stock price, market index returns and Beta are collected from CRSP and the end of fiscal year date, report date of quarterly earnings, actual EPS, total liabilities, total stockholders’ equity and market capitalization are all available in the COMPUSTAT database.
At first, data from 2011 and 2012 was collected, to have the most recent observations possible. However, most of the data from 2012 was not complete, so data from 2010 and 2011 was collected instead. The composition of the sample and the division of good and bad news observations are tabularized in panels A and B of Table 1.

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2010</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Starting number of observations</strong></td>
<td>2121</td>
<td>1901</td>
<td>4022</td>
</tr>
<tr>
<td>Eliminations due to missing data</td>
<td>(794)</td>
<td>(604)</td>
<td>(1398)</td>
</tr>
<tr>
<td>Eliminations due to forecasts older than 30 days</td>
<td>(255)</td>
<td>(413)</td>
<td>(668)</td>
</tr>
<tr>
<td>Eliminations due to fiscal year end not 31-12</td>
<td>(511)</td>
<td>(513)</td>
<td>(1024)</td>
</tr>
<tr>
<td><strong>Observations remaining</strong></td>
<td>561</td>
<td>371</td>
<td>932</td>
</tr>
</tbody>
</table>

**TABLE 1**

Panel B: Good versus bad news

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2010</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good news (UE &gt; 0)*</td>
<td>393</td>
<td>290</td>
<td>683</td>
</tr>
<tr>
<td>Bad news (UE &lt; 0)*</td>
<td>168</td>
<td>81</td>
<td>249</td>
</tr>
</tbody>
</table>

*This table presents the sample composition and clarifies why and how many observations were omitted. Also, this table shows how many earnings announcements contained good news, and how many contained bad news. Finally, it shows how many observations are used from each year.

b If unexpected earnings (UE) is bigger than zero, then the company performed better than expected in this period, so the earnings announcement contained good news. If UE is smaller than zero, the observation is classified as bad news.

The raw data file contained 4022 observations, which is in line with the expected total number of observations of 500 companies during 8 quarters (2 years). A total number of 1398 (604 during 2010 and 794 during 2011) rows had to be omitted because they were missing one or more values. Because the measure of expected earnings is based on earnings forecasts, a limit was set on the number of days old that the forecasts were allowed to be. If the forecasts were made earlier than 30 days prior to the earnings announcement, they were omitted from the analysis. There were 668 forecasts (413 in 2010 and 255 in 2011) that were older than 30 days at the time of the announcement and therefore those observations were excluded from the dataset. Because the model used in this study requires a lot of data to be hand collected (stock returns around 8 quarterly announcements that all took place at
different dates, for each company in the sample and market model regressions for the robustness check) the sample size had to be reduced further to finish the study in the given timeframe. The criterion used to reduce the sample size is fiscal year ending date different from December 31 (it has become clear that using this criterion to simply reduce the sample size is not appropriate, see limitations). The total number of observations omitted from the sample due to a deviating fiscal year ending is 1024 (513 in 2010 and 511 in 2011). This leads to a remaining sample size of 932 observations (371 in 2010 and 561 in 2011).

The distinction between good and bad news is made based on the sign of unexpected earnings (UE). If unexpected earnings is negative, then that means that the company did not meet the market’s expectations and the earnings announcement is classified as bad news. Similarly, if unexpected earnings is positive, then the company exceeded the market’s expectations and the earnings announcement is classified as good news. In the final sample, there are 683 good news observations (290 in 2010 and 393 in 2011) and 249 bad news observations (81 in 2010 and 168 in 2011).
V. RESULTS

V.1 Descriptive statistics and univariate analyses

Panels A and B in Table 2 report descriptive statistics for the good news and bad news samples respectively.

### TABLE 2

**Panel A: Descriptive statistics: Good news**

<table>
<thead>
<tr>
<th></th>
<th>AR</th>
<th>LAG</th>
<th>UE</th>
<th>SIZE</th>
<th>DERATIO</th>
<th>BETA</th>
<th>MBRATIO</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>683</td>
<td>683</td>
<td>683</td>
<td>683</td>
<td>683</td>
<td>683</td>
<td>683</td>
</tr>
<tr>
<td>Mean</td>
<td>0.008</td>
<td>30.009</td>
<td>0.119</td>
<td>18.568</td>
<td>1,959</td>
<td>1,113</td>
<td>1,198</td>
</tr>
<tr>
<td>Median</td>
<td>0.005</td>
<td>28.000</td>
<td>0.070</td>
<td>18.563</td>
<td>1,526</td>
<td>1,101</td>
<td>1,813</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>0.050</td>
<td>8.133</td>
<td>0.178</td>
<td>1.021</td>
<td>7,216</td>
<td>0.458</td>
<td>15,063</td>
</tr>
<tr>
<td>Minimum</td>
<td>-0.221</td>
<td>1,000</td>
<td>0.010</td>
<td>16,139</td>
<td>-102,672</td>
<td>0.000</td>
<td>-319,127</td>
</tr>
<tr>
<td>Maximum</td>
<td>0.278</td>
<td>60.000</td>
<td>2,810</td>
<td>21,494</td>
<td>36,870</td>
<td>2,443</td>
<td>25,943</td>
</tr>
</tbody>
</table>

**Panel B: Descriptive statistics: Bad News**

<table>
<thead>
<tr>
<th></th>
<th>AR</th>
<th>LAG</th>
<th>UE</th>
<th>SIZE</th>
<th>DERATIO</th>
<th>BETA</th>
<th>MBRATIO</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>249</td>
<td>249</td>
<td>249</td>
<td>249</td>
<td>249</td>
<td>249</td>
<td>249</td>
</tr>
<tr>
<td>Mean</td>
<td>-0.024</td>
<td>31,273</td>
<td>-0.127</td>
<td>18,377</td>
<td>2,395</td>
<td>1,223</td>
<td>1,704</td>
</tr>
<tr>
<td>Median</td>
<td>-0.020</td>
<td>31,000</td>
<td>-0.050</td>
<td>18,242</td>
<td>1,643</td>
<td>1,254</td>
<td>1,501</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>0.064</td>
<td>8.322</td>
<td>0.254</td>
<td>0.937</td>
<td>2,683</td>
<td>0.509</td>
<td>1,456</td>
</tr>
<tr>
<td>Minimum</td>
<td>-0.353</td>
<td>9,000</td>
<td>-2,720</td>
<td>16,023</td>
<td>-3,685</td>
<td>0.000</td>
<td>-12,730</td>
</tr>
<tr>
<td>Maximum</td>
<td>0.275</td>
<td>59,000</td>
<td>-0.010</td>
<td>21,469</td>
<td>15,737</td>
<td>2,443</td>
<td>8,226</td>
</tr>
</tbody>
</table>

This table contains descriptive statistics for the good (Panel A) and bad (Panel B) news samples. An observation is classified as good news if unexpected earnings (UE) > 0, while observations with UE < 0 are classified as bad news.

Abnormal returns are calculated according to the market adjusted return model, using daily stock returns retrieved from CRSP. Reporting lag (LAG) is calculated by subtracting the end of the fiscal period date from the report date. UE is calculated by subtracting forecasted earnings from reported earnings. SIZE is calculated by the natural logarithm of the firm’s market capitalization. DERATIO is calculated by dividing the firm’s total liabilities by its stockholders’ equity. BETA is retrieved from CRSP. MBRATIO is calculated by dividing the firm’s market value by its book value.

The first observation that can be made when looking at Table 1 is that abnormal returns on average are positive (0.008) when the earnings announcement contains good news, and negative (-0.024) when it contains bad news. Also, the stock price decline resulting from bad news announcements seems to be larger than the stock price increase following good news announcements (on average). This effect is consistent with the asymmetric loss function that companies face according to prior research by Skinner & Sloan (2002).

Another interesting finding is the difference in reporting lag between the two samples. Prior research by Bagnoli et. al (2002), Begley & Fischer (1998), Givoly & Palmon (1982),
Chambers & Penman (1982) and Sengupta (2004) suggests that reporting lag is larger for announcements bearing bad news. In this study, the average reporting lag is 1 day longer for bad news announcements than for good news announcements and (looking at Table 3) the difference is significant. Also, companies tend to report their earnings approximately one month after the end of the fiscal quarter on average.

The riskiness of firms reporting bad news seems to be higher according to both the risk measures. The mean debt-to-equity ratio for good news observations is 1,959 while the bad news sample has a mean debt-to-equity ratio of 2,395. Also, the beta of bad news observations is higher on average (1,223 versus 1,113 for good news observations). Of the two differences in the risk measures, Table 3 reports that only the difference in beta is significant. There is also a difference in the means of market-to-book ratio, suggesting that firms who report negative unexpected earnings are more conservative on average. This is consistent with the notion that conservative firms tend to understate earnings. However, according to Table 3 the difference in market-to-book ratio between the two samples is not significant.

Table 3 reports the results from a t-test and compares the means of the two samples.

<table>
<thead>
<tr>
<th></th>
<th>Good news</th>
<th>Bad news</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>AR</td>
<td>.0077949</td>
<td>-.0236330</td>
<td>.03142***</td>
</tr>
<tr>
<td>LAG</td>
<td>30.01</td>
<td>31.27</td>
<td>-1.2643**</td>
</tr>
<tr>
<td>UE</td>
<td>.118887</td>
<td>-.127390</td>
<td>.24625***</td>
</tr>
<tr>
<td>SIZE</td>
<td>18.5676</td>
<td>18.3767</td>
<td>.19083***</td>
</tr>
<tr>
<td>DERATIO</td>
<td>1.9595</td>
<td>2.3951</td>
<td>-0.43568</td>
</tr>
<tr>
<td>BETA</td>
<td>1.1131</td>
<td>1.2227</td>
<td>-0.10957***</td>
</tr>
<tr>
<td>MBRATIO</td>
<td>1.1982</td>
<td>1.7039</td>
<td>-0.50573</td>
</tr>
</tbody>
</table>

*** = significant at the 0.01 interval  
** = significant at the 0.05 interval  
*This table compares the means between the good and bad news samples using an independent samples t-test.

From Table 3 it turns out that the difference in firm size is also significant. This implies that firms who report positive unexpected earnings are larger on average.
V.2 Correlation matrix

Table 4 reports the Pearson correlation coefficients of both samples.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AR  LAG  UE  SIZE  DERATIO  BETA</td>
<td>AR  LAG  UE  SIZE  DERATIO  BETA</td>
</tr>
<tr>
<td>LAG</td>
<td>0.028</td>
<td>0.079</td>
</tr>
<tr>
<td>UE</td>
<td>0.064* 0.001</td>
<td>-0.049 -0.016</td>
</tr>
<tr>
<td>SIZE</td>
<td>-0.110*** -0.142*** 0.104***</td>
<td>0.155** -0.149** -0.077</td>
</tr>
<tr>
<td>DERATIO</td>
<td>-0.013 -0.019 0.032 0.071*</td>
<td>0.015 0.011 -0.248*** 0.139**</td>
</tr>
<tr>
<td>BETA</td>
<td>0.134*** -0.05 0.06 -0.233*** 0.111***</td>
<td>0.033 -0.169*** -0.230*** -0.155** 0.147**</td>
</tr>
<tr>
<td>MBRATIO</td>
<td>-0.004 0.028 -0.025 0.026 0.684*** 0.071*</td>
<td>-0.043 -0.093 0.113* -0.003 -0.027 -0.047</td>
</tr>
</tbody>
</table>

* = significant at the 0.1 level
** = significant at the 0.05 level
*** = significant at the 0.01 level

*aThis table reports the correlation coefficients to get a preliminary indication of the relation between the variables and to check for multicollinearity.
Preliminary results indicate that the effect of reporting lag on the abnormal return associated with the earnings announcement is not significant. However, the regression analysis will point out that this is not entirely true.

In the good news sample, there is a significant correlation between unexpected earnings and abnormal returns, while this correlation is not significant in the bad news sample. Interestingly, the correlation coefficient between abnormal returns and firm size is negative in the good news sample, and positive in the bad news sample. This could mean that both the stock price increase in case of good news and the stock price decrease in case of bad news are smaller for larger firms than for smaller firms. This is consistent with the notion that larger firms’ stock prices are less volatile around earnings announcements than those of smaller firms, as observed Atiase (1985). This is confirmed by the regression analysis.

Abnormal return is also significantly correlated with beta, but only in the good news sample. The relation is positive, so this is a sign that if a stock’s volatility is higher, the price increase in case of good news is larger. Although that is an intuitive effect, the relationship is surprisingly not significant in the bad news sample.

In both samples, reporting lag is significantly and negatively correlated with firm size. This points at the possible effect that larger firms tend to report sooner in both good and bad news situations. This is consistent with the findings in prior literature by Chambers & Penman (1984). Also, beta is significantly correlated with reporting lag, but only in the bad news sample. This negative relationship seems to indicate that riskier firms report their earnings later than less risky firms if the news contained in the earnings announcement is bad.

Because the highest correlation coefficient is 0.684, there are no multicollinearity problems present.
V.3 Regression analysis

Table 5 reports the results from the regression analysis on the bad news sample.

**TABLE 5**

Regression analysis: Bad news

\[ AR_{i,t} = \alpha + \beta_1 \text{LAG}_{i,t} + \beta_2 \text{UE}_{i,t} + \beta_3 \text{SIZE} + \beta_4 \text{DERATIO}_{i,t} + \beta_5 \text{BETA}_{i,t} + \beta_6 \text{MBRATIO}_{i,t} + \epsilon \]

<table>
<thead>
<tr>
<th>Model</th>
<th>Adjusted R2</th>
<th>F-statistic</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.019</td>
<td>1.785</td>
<td>0.083*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Predicted sign</th>
<th>Unstandardized coefficients (β)</th>
<th>T-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAG</td>
<td>?</td>
<td>0.001*</td>
<td>1.794</td>
</tr>
<tr>
<td>UE</td>
<td>+</td>
<td>-0.005</td>
<td>-.276</td>
</tr>
<tr>
<td>SIZE</td>
<td>-</td>
<td>0.013***</td>
<td>2.832</td>
</tr>
<tr>
<td>DERATIO</td>
<td>+</td>
<td>-0.001</td>
<td>-.447</td>
</tr>
<tr>
<td>BETA</td>
<td>+</td>
<td>0.010</td>
<td>1.182</td>
</tr>
<tr>
<td>MBRATIO</td>
<td>-</td>
<td>-0.001</td>
<td>-.421</td>
</tr>
</tbody>
</table>

* = significant at the 0.1 level
*** = significant at the 0.01 level

*a This table reports the results of the regression analysis of the bad news sample, where the effect of reporting lag on abnormal returns around an earnings announcement is investigated. This sample solely contains observations where unexpected earnings (UE) < 0.
b Abnormal returns are calculated according to the market adjusted return model, using daily stock returns retrieved from CRSP. Reporting lag (LAG) is calculated by subtracting the end of the fiscal period date from the report date. UE is calculated by subtracting forecasted earnings from reported earnings. SIZE is calculated by the natural logarithm of the firm’s market capitalization. DERATIO is calculated by dividing the firm’s total liabilities by its stockholders’ equity. BETA is retrieved from CRSP. MBRATIO is calculated by dividing the firm’s market value by its book value.

The adjusted R squared of the bad news model is 1.9%, so the explanatory power of the model is quite low. This is understandable however, since the model is attempting to predict stock returns, and there are always unobservable forces affecting a company’s stock return.
Even though the explanatory power is low, the model is significant at the 10% level, so it is reasonable to assume that the observed effects on the dependent variable are genuine.

In the bad news sample, reporting lag has a significant effect (at the 10% level) on the abnormal return around the earnings announcement when there is bad news in the report. According to Table 5, the abnormal return is higher if the announcement is later. In other words, the stock price decline is smaller if the reporting lag is bigger. This suggests that bad news reports are either anticipated by investors, or part of the information contained in the report becomes available through alternative channels, consistent with Givoly & Palmon (1982). This causes the stock price reaction to be smaller, because the report contains less new information. This leads to a rejection of H1.

Interestingly, the unexpected earnings number of the firm does not seem to affect the stock price reaction around the earnings announcement. This finding confirms the preliminary results observed in the correlation matrix. It seems that if firms do not meet the analyst earnings forecast, it is no longer important how big the difference between the forecasted and actual earnings is.

Of the remaining control variables, only firm size is significantly related (on the 1% level) to abnormal return. The sign of the coefficient is negative, so that means that larger firms face smaller stock price declines when they announce bad news compared to smaller firms.

Table 6 reports the results from the regression analysis on the good news sample.
TABLE 6
Regression analysis: Good news

\[ \text{AR}(i, t) = \alpha + \beta_1 \text{LAG}(i, t) + \beta_2 \text{UE}(i, t) + \beta_3 \text{SIZE} + \beta_4 \text{DERATIO}(i, t) + \beta_5 \text{BETA}(i, t) + \beta_6 \text{MBRATIO}(i, t) + \varepsilon \]

<table>
<thead>
<tr>
<th>Model</th>
<th>Adjusted R2</th>
<th>F-statistic</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.021</td>
<td>3.471</td>
<td>0.002</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Predicted sign</th>
<th>Unstandardized coefficients (β)</th>
<th>T-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAG</td>
<td>?</td>
<td>0.000</td>
<td>0.542</td>
</tr>
<tr>
<td>UE</td>
<td>+</td>
<td>0.019*</td>
<td>1.744</td>
</tr>
<tr>
<td>SIZE</td>
<td>-</td>
<td>-0.004**</td>
<td>-2.142</td>
</tr>
<tr>
<td>DERATIO</td>
<td>+</td>
<td>0.000</td>
<td>-0.565</td>
</tr>
<tr>
<td>BETA</td>
<td>+</td>
<td>0.012***</td>
<td>2.877</td>
</tr>
<tr>
<td>MBRATIO</td>
<td>-</td>
<td>0.000</td>
<td>0.227</td>
</tr>
</tbody>
</table>

* = significant at the 0.1 level  
** = significant at the 0.05 level  
*** = significant at the 0.01 level

aThis table reports the results of the regression analysis of the good news sample, where the effect of reporting lag on abnormal returns around an earnings announcement is investigated. This sample solely contains observations where unexpected earnings (UE) > 0. Abnormal returns are calculated according to the market adjusted return model, using daily stock returns retrieved from CRSP. Reporting lag (LAG) is calculated by subtracting the end of the fiscal period date from the report date. UE is calculated by subtracting forecasted earnings from reported earnings. SIZE is calculated by the natural logarithm of the firm’s market capitalization. DERATIO is calculated by dividing the firm’s total liabilities by its stockholders’ equity. BETA is retrieved from CRSP. MBRATIO is calculated by dividing the firm’s market value by its book value.

Similar to the bad news sample, the regression model for good news has a low Adjusted R squared (2.1%). This model is significant at the 1% level, so it is more significant than the bad news sample. A likely cause for the higher significance of this model is the larger sample size of 683 observations (versus 249 in the good news sample).

In contrast to the bad news sample, reporting lag does not seem to have a clear effect on the abnormal return of a company around its earnings announcement if the announcement
contains good news. This leads to a confirmation of H2. A possible explanation for this can be found in Givoly & Palmon (1982), who state that the average reporting lag is mostly dependent on industry patterns and tradition instead of the news content of the report (especially for large firms). Assuming that investors are aware of this, then it is unlikely that they will anticipate bad news if the announcement is delayed. This means that investors’ expectations about earnings do not change significantly if the reporting lag increases, and the stock price reaction is similar for early and late announcements. However, since the results from the bad news sample contradict this, there could be a different explanation. It is also possible that firms who report good news have a very low variance in their reporting lag, making it difficult to identify a significant effect. However, since the standard deviation of reporting lag in the good news sample is approximately equal to that of the bad news sample (observed in Table 2), this also seems unlikely. Further research is necessary to find the explanation for this phenomenon.

Unexpected earnings is positively and significantly (at the 10% level) associated with abnormal return in the case of good news. This means that the higher the unexpected earnings are, the larger the stock price increase at the time of the announcement. This result is consistent with the value relevance literature by Ball & Brown (1968) and Beaver (1968).

Of the remaining control variables, the coefficients of firm size and beta are significant (at the 5% and 1% level respectively). Firm size is negatively related to abnormal returns, so the stock price increase related to earnings announcements containing good news is smaller for bigger firms. This is consistent with the results from the good news sample, since it shows that the stock returns of big companies are less volatile than those of small companies. Also, if a firm is riskier (according to its Beta) the stock price increase is larger. Both of these results are intuitive: larger firms have less volatile stock returns, and firms with higher betas have more volatile stock returns.

**V.4 Additional tests**

To make sure that the above reported results are reliable, a robustness check is performed in which the abnormal returns are calculated using an alternative model. The model used in the original test was the Market adjusted returns model, which corrects the firm specific return for the market return. In the following test, abnormal returns are calculated using the Market
model. This model is used in Easton & Zmijewski (1989), Strong (1992), Foster (1981), Annaert et. al (2002), Patell & Wolfson (1982) and Givoly & Palmon (1982). The market model is defined as follows:

\[ R_{i,t} = \alpha_i + \beta_i M_{R_t} + \varepsilon_i \]

where:

- \( R_{i,t} \) = Firm specific return of company \( i \) in period \( t \).
- \( \alpha_i \) = Firm specific constant.
- \( \beta_i \) = Firm specific Beta (correlation between firm specific return and market return).
- \( M_{R_t} \) = Market return in period \( t \).
- \( \varepsilon_i \) = Firm specific error term, used as a proxy for abnormal return.

Where the market adjusted return model assumes that the return of a firm is always perfectly correlated with the return of the market (\( \beta = 1 \)), the market model estimates the \( \alpha \) and \( \beta \) terms by running a regression on 250 daily stock returns preceding the earnings announcement for each company, where the dependent variable is the firm specific return, and the independent variable is the market return. The firm specific coefficients \( \alpha \) and \( \beta \) are then used to find the error term \( \varepsilon \) in the equation. This term represents the unexpected component of the firm specific return. Hence, the error term is used as a proxy for abnormal return.

The betas that are estimated by the market model and the betas used as a control variable (collected from CRSP) are highly correlated with each other (correlation coefficient of 0.917, significant at the 1% level), so using betas from two different sources in this case is unlikely to cause problems in the analysis.

The results of the regression using the market model for the bad news sample are presented in Table 7.
TABLE 7
Regression analysis: Bad news (market model)

\[ \text{AR}_{i,t} = \alpha + \beta_1 \text{LAG}_{i,t} + \beta_2 \text{UE}_{i,t} + \beta_3 \text{SIZE} + \beta_4 \text{DERATIO}_{i,t} + \beta_5 \text{BETA}_{i,t} + \beta_6 \text{MBRATIO}_{i,t} + \varepsilon \]

<table>
<thead>
<tr>
<th>Model</th>
<th>Adjusted R2</th>
<th>F-statistic</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.023</td>
<td>1.984</td>
<td>0.069</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Predicted sign</th>
<th>Unstandardized coefficients (β)</th>
<th>T-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAG</td>
<td>?</td>
<td>0.001**</td>
<td>1.940</td>
</tr>
<tr>
<td>UE</td>
<td>+</td>
<td>-0.002</td>
<td>-0.123</td>
</tr>
<tr>
<td>SIZE</td>
<td>-</td>
<td>0.013***</td>
<td>2.937</td>
</tr>
<tr>
<td>DERATIO</td>
<td>+</td>
<td>-0.001</td>
<td>-0.688</td>
</tr>
<tr>
<td>BETA</td>
<td>+</td>
<td>0.013*</td>
<td>1.638</td>
</tr>
<tr>
<td>MBRATIO</td>
<td>-</td>
<td>-0.001</td>
<td>-0.330</td>
</tr>
</tbody>
</table>

* = significant at the 0.1 level
** = significant at the 0.05 level
*** = significant at the 0.01 level

This table reports the regression results of the bad news sample using the market model to estimate abnormal return. This sample solely contains observations where unexpected earnings (UE) < 0.

Abnormal returns are calculated according to the market model, using daily stock returns retrieved from CRSP. Reporting lag (LAG) is calculated by subtracting the end of the fiscal period date from the report date. UE is calculated by subtracting forecasted earnings from reported earnings. SIZE is calculated by the natural logarithm of the firm's market capitalization. DERATIO is calculated by dividing the firm's total liabilities by its stockholders' equity. BETA is retrieved from CRSP. MBRATIO is calculated by dividing the firm's market value by its book value.

Using a different method to calculate abnormal return does not cause a big difference in the results for the bad news sample. Using the market model, the adjusted R squared is slightly higher, as is the model’s significance. The coefficients are a little lower when using the market model, but the significance LAG rises from the 10% level to the 5% level. Also, where BETA was insignificant using market adjusted returns, it has a significant effect on abnormal returns when using the market model.
The results of the regression using the market model for the good news sample are presented in Table 8.

<table>
<thead>
<tr>
<th>Model</th>
<th>Predicted sign</th>
<th>Unstandardized coefficients (β)</th>
<th>T-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAG</td>
<td>?</td>
<td>0.000182</td>
<td>774</td>
</tr>
<tr>
<td>UE</td>
<td>+</td>
<td>0.0180*</td>
<td>1689</td>
</tr>
<tr>
<td>SIZE</td>
<td>-</td>
<td>-0.003*</td>
<td>-1774</td>
</tr>
<tr>
<td>DERATIO</td>
<td>+</td>
<td>-0.0002</td>
<td>-462</td>
</tr>
<tr>
<td>BETA</td>
<td>+</td>
<td>0.011**</td>
<td>2493</td>
</tr>
<tr>
<td>MBRATIO</td>
<td>-</td>
<td>0.00003</td>
<td>185</td>
</tr>
</tbody>
</table>

* = significant at the 0.1 level  
** = significant at the 0.05 level

As was the case in the bad news sample, the results using both abnormal return models for the good news sample are similar. However, where the R squared and significance of the bad news sample went up when using the market model, they both go down in the good news sample. Also, the coefficients are slightly lower and less significant.
All in all it can be concluded that the results of this study are robust when using a different proxy for abnormal return. This is consistent with Strong (1992), who concludes that the precise date of the event is more important than the choice of statistical models in event studies. Since the earnings announcement dates are readily available, the robustness of the results was to be expected.
VI. CONCLUSION

This study examines the effect of reporting lag on the stock price reaction to earnings announcements. The results in prior literature on this subject are mixed. Where one study suggests that reactions to later earnings announcements are more negative, the other indicates that due to investors’ anticipation of bad news and potential information leakage the stock price reaction becomes smaller when the announcement is later.

The preliminary results from the descriptives and the t-test show that abnormal returns are negative on average for firms reporting bad news, and positive on average for firms reporting good news. This confirms that the income number has some relevance for models predicting stock returns. Also, it seems that the reporting lag is 1 day longer on average for firms reporting bad news, so firms reporting bad news tend to delay the announcement slightly.

The results of the regression analysis confirm the belief that earnings announcements lose some of their relevance as reporting lag grows. When news is bad, delaying the earnings announcement leads to a smaller stock price decline. Although the effect of reporting lag is small, it is also significant. However, this is only true when the announcement contains bad news. If a company exceeds investors’ expectations, announcement timing becomes seemingly irrelevant. Another interesting finding is that the magnitude of the news contained in the earnings announcement only influences the stock price reaction if the news is good. In case of bad news, the fact that the company did not meet the expectations is important, but the magnitude of the news is not significant. For both good and bad news announcements, firm size is a significant factor. The results indicate that bigger companies face smaller stock price reactions. In other words, stock returns are less volatile if the company is bigger.

These findings have several implications for academic researchers and managers who are tasked with decision making regarding disclosure timing. It is important to know that the timing of earnings announcements containing good news is not an important factor influencing the company’s stock price. If the news is bad however, disclosure timing has a small, yet significant effect on the stock price reaction.
The question remains whether the cumulative effect of the stock price decline during the period leading to the announcement and the negative reaction when the news is officially announced is bigger or smaller than the stock price reaction when the earnings are announced immediately after the end of the fiscal quarter. This has not been investigated in this study, so no conclusions can be drawn as to whether delaying an earnings announcement actually makes a difference when looking at a longer time window, so this requires further research. Another area where further research is needed is the apparent irrelevance of the magnitude of negative unexpected earnings. This particular result was unexpected, so further research into this matter would be helpful.

This study has several limitations. First, the model is not capable of explaining the majority of the variance (approximately 98% is unexplained), so there appear to be a lot of variables affecting stock returns that are not included in this study. This is a well known problem that models predicting stock returns face, because a large amount of forces influencing stock returns are not easily quantitively measured. However, including the analyst forecast revision variable from Easton & Zmijewksi (1989)’s model could improve its power. Also, other information related variables such as dividend announcements and management earnings forecasts might be appropriate additions to the model.

Another limitation is the size of the bad news sample. This causes the results from the bad news sample to be less reliable, and since the most significant results are found in the bad news sample, a bigger sample size would have been useful. Also, because the sample size was reduced by omitting firms with fiscal years that end at a different date than December 31, the chosen sample was not random. This could distort the results, since it is possible that the omitted firms have different characteristics that could have affected the outcome of this study.

Another important limitation of this study is the difficulty of measuring timeliness. There is likely to be a lot of measurement error in that specific variable, because the exact time that managers become aware of important information is not observable. This leads to an imperfect measure of timeliness and because of this, less reliable results.
The last limitation of this study is the dispersion of the age of earnings forecasts. In the Appendix of this study the age of analyst forecasts is analyzed and there is substantial dispersion between them. Some forecasts are made one week or less before the earnings announcement, while others are three weeks older than that. This could cause inaccuracy in the unexpected earnings measure, because older forecasts are often less reliable than more recent ones.
APPENDIX

To see whether the earnings forecasts used to estimate unexpected earnings are comparable, the frequency of the age of the earnings forecasts is presented in Figure 1.

![Figure 1 Frequency distribution of the age of analyst forecasts](image)

It is immediately clear that the dispersion of the age of the forecasts is quite high. This causes a difference in reliability between forecasts made close to the earnings announcement and those that are made approximately one month earlier. Because of this, the value of unexpected earnings might not be accurate for all observations used in this study.
REFERENCES


