Stock Returns Following Profit Warnings: Evidence from the Dutch Stock Market

Maarten Heesters
25.79.19
November 2011
Faculty of Economics and Business Administration
Master Investment Analysis
Supervisor: Dr. F. Castiglionesi

Abstract

This research examines how the market reacts to a profit warning announcement in the short and medium term and whether this reaction is more negative for qualitative warnings compared to quantitative warnings. A quantitative warning is a statement that contains a new numerical revised forecast and is considered to be a precise signal. A qualitative warning contains no new numerical revised forecast and is considered to be a less precise signal. The sample consists of 117 first-time profit warning issued by firms listed at Euronext Amsterdam between 2001 and 2007. Consistent with the extant literature this paper shows that profit warnings are followed by large negative abnormal returns in the short-term. In the medium-term abnormal returns continue to drift downward for the entire twelve month post-event period, a phenomenon that is usually attributed to market underreaction. However contrary to the prediction qualitative warning firms outperform quantitative warning firms in a one year post-event period by 19,7%

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Introduction

Stock markets need a flow of relevant and timely information to function efficiently. Most firms have the objective to actively inform the market and meet regulatory requirements. The Euronext Amsterdam listing and issuing rules (article 28h) obliges firms to immediately disclose price sensitive information regarding any facts or events which are expected to have a significant effect on the stock price. An example of a price sensitive event is a profit warning announcement. A profit warning is a public announcement saying that earnings for a reported period will not meet expectations. Firm managers tend to issue a profit warning when previous forecasts are believed to be too optimistic or unforeseen changes in economic or operational conditions have occurred. Such a statement is an extremely visible signal to investors declaring a significant negative change in the performance of a firm. What effect does such an extreme disappointment has on stock returns? This research examines the short and medium term stock performance of firms issuing a profit warning announcement.

In the literature there is substantial evidence of medium-term price continuation following various corporate announcements. One of the most robust findings is the evidence of post-earnings-announcement drift (Ball & Brown, 1968; Bernard & Thomas, 1989, 1990). This is the phenomenon that stock returns continue to drift downward (upward) for several months after a negative (positive) earnings surprise reported at the scheduled earnings announcement date. The general explanation for this phenomenon is market underreaction. Since profit warnings are similar earnings surprises except for the fact they are unexpected it is interesting to see whether there is a similar drift.

Furthermore the issuance of a profit warning presents managers with a disclosure dilemma regarding the degree of information to disclose to the market. Managers have the possibility to choose between a quantitative and a qualitative profit warning. A quantitative warning is a statement that contains a new numerical revised forecast and is considered to be a precise signal. A qualitative warning is a statement that earnings for a reported period will not meet expectations, i.e. it contains no new numerical revised forecast and is considered to be a less precise signal. Moreover the lack of information disclosure in the form of a qualitative warning is directly observable for investors.

In the short term the theoretical model of Milgrom (1981) predicts that the best possible disclosure strategy for an informed manager is the one of full disclosure under the assumption

that disclosure is costless and investors are able to detect any withholding of information. Since investors are able to detect any withholding of information partial disclosure is interpreted by the market as worse news and leads to a discounted stock price. In the medium term the behavioral model of Daniel et al. (1998) predicts that psychological biases leading to market underreaction are enhanced when the precision of a signal decreases, i.e. larger market underreaction. Bulkley and Herrerias (2005) translated both theories to profit warnings by predicting a more negative market reaction for qualitative warnings in the short and medium term.

The objective of this paper is to examine the market reaction to profit warning announcements issued by firms listed at Euronext Amsterdam, in particularly whether there is evidence of post-event drift. Furthermore this research examines whether the market reaction is more negative for qualitative warnings compared to quantitative warnings in the short and medium term. So far, evidence regarding these two topics is limited to the study of Bulkley and Herrerias (2005) in the US. It is therefore interesting to see whether their findings are robust for a non-US market. In addition, this research examines whether the influence of qualitative warnings is robust after controlling for several factors in a multivariate regression analysis.

In the Netherlands, Church and Donker (2010) is the only known study that examined the market reaction to profit warnings. This study differs by examining a longer sample period and the medium term stock price performance. Furthermore, Church and Donker (2010) examined whether the market reaction differs for firms disclosing external or internal reasons as the motive for issuing a profit warning, whereas this study focuses on the difference between two types of warnings.

The sample is based upon all firms listed at Euronext Amsterdam during 2001 to 2007 and contains a total of 117 first-time profit warnings. The event study methodology is used to calculate abnormal performance in both the short and medium term. Following the work of Barber and Lyon (1997) the buy-and-hold approach is used to calculate abnormal performance in the medium term where the benchmark consists of a single control firm similar in size and market-to-book and a market model. To compare the mean difference between qualitative and quantitative warnings a univariate regression analysis is conducted. Next, a multivariate regression analysis examines whether the results are robust after controlling for several factors that might explain the market reaction to profit warnings.

The remainder of this paper is organized as follows. Section two starts with reviewing the relevant literature. In section three, theoretical and empirical findings are translated into various testable hypotheses. Section four describes the data and methodology. In section five the results of the event study and regression analysis are presented and discussed. Lastly, section six concludes.

2 Literature Review

The objective of this thesis is to examine whether stock returns continue to drift downward after a profit warning announcement. In addition, this research examines whether the market reaction in more negative for qualitative warnings compared to quantitative warnings in the short and medium term. Section one starts with a discussion of the efficient market theory, which is the fundamental thought concerning the appropriate stock price behavior. Next, section two discusses the post-earning-announcement drift phenomenon one of the most robust evidence against the efficient market theory. Section three discusses the literature regarding the possible motives for issuing a profit warning in order to improve our understanding about this statement. Finally, section four discusses the influence of disclosure quality on the market reaction.

2.1 Efficient market hypothesis

The fundamental efficient market theory gives us a clear view how stock prices should behave, which is essential for investors as well as financial managers. The term efficient markets, was first introduced by Fama (1965) in his paper "*Random walks in stock market prices*". According to the random walk hypothesis price changes are random and independent from previous ones, suggesting stock markets are efficient. The premises about efficient stock markets led to the formulation of the efficient market hypothesis (Fama, 1970). The efficient market hypothesis (hereafter, EMH) is the proposition that stock prices always fully reflect all available information about the value of a firm. Stock prices only change when new information arrives in the market. Moreover this information spreads quickly and is incorporated into prices without delay. Since information is by definition unpredictable (otherwise it would be incorporated into prices), stock prices cannot be predicted and thus follow a random walk. For investors, the EMH implies that it is impossible to predict future returns and generate abnormal returns using technical or fundamental analysis. Investors earn on average the equilibrium rate of return (normal return), i.e. compensation on factors such as non-diversifiable risk, size etc. The appropriate normal rate of return is determined by a benchmark model such as a market model or the capital-asset-pricing model.. With the proposition of the EMH researchers should be able to measure the effect of new information by tracing stock prices. This led to the first event study conducted by Fama, Fisher, Jensen, and Roll (1969), who studied stock price performance around stock splits. Their primary goal was to examine how fast stock prices adjust to new information. They found no evidence of abnormal returns and concluded that financial markets are efficient.

Since the EMH is so general, Fama (1970) divided it into three categories to make it empirical testable for different kinds of information sets or levels of efficiency. In each category stock prices reflect a different amount of available information. The three categories are weak, semi-strong and strong form efficiency. Weak-form efficiency implies that all past information is incorporated into asset prices. The intuition behind this is that asset prices are probably the most public and available piece of information. Any investment strategy that seeks to earn abnormal returns based on historical price information is therefore useless. Semi-strong form efficiency implies that all publicly available information is incorporated into asset prices. This public information does not only include historical prices, but also accounting information, company announcements, quality of management etc. Again this implies that investors are unable to generate abnormal returns using historical price or public information. Strong-form efficiency implies that all existing information both private and public information is incorporated into asset prices. The strong-form efficiency implies that it is impossible to earn more than the equilibrium rate of return, since prices reflect all information. Thus even managers or employees are unable to benefit from insider information.

2.2 Post-announcement drift

On a broader level profit warnings are related to earning announcements containing surprises. The only difference is that earnings announcements have a predetermined date and profit warnings are unexpected. According to the semi-strong efficient market hypothesis (Fama, 1970) stock prices react quickly in an unbiased matter to new public information. Over the years many researchers studied the market reaction in response to earnings information. This led to the discovery of one of the most robust anomaly in finance and accounting literature: post-earnings-announcement drift (hereafter, PAD). PAD is the phenomenon that stock returns continue to drift downward (upward) following a negative (positive) earnings signal reported at the scheduled earnings announcement date.

In a seminar work, Ball and Brown (1968) were the first one who provided evidence of the PAD phenomenon after studying annual earnings announcements in the US for the period

1946-1966. Since then, many researchers found supporting evidence for this phenomenon using more recent data and for various markets outside the US[1].

After the discovery of this anomaly many researchers tried to explain the phenomenon and up to now no consensus has been reached regarding the source of the drift. The explanations include: methodological issues, misspecification of normal returns and market underreaction.

Bernard and Thomas (1989, 1990) and Ball (1992) show that PAD cannot be attributed to research design flaws such as: 1) survivorship bias, 2) hindsight bias arising from restatements of CRSP data or 3) measurement errors in CRSP returns resulting from imbalances in quoting bid or ask prices. In addition, Bernard and Thomas (1989) studied whether PAD is the result of CAPM misspecifications. They show that neither factors from the arbitrage-pricing theory nor beta fluctuations around earnings announcements are able to explain the drift. Fama (1998) failed to explain the phenomenon using a three-factor model (Fama & French, 1996), which extends the CAPM model with two additional factors (a) the difference between the return on a portfolio of small and large stocks and (b) the difference between a portfolio of high and low book-to-market stocks.

The third explanation is that markets underreact to earnings announcement, and is considered by many researchers as the predominant explanation. Market underreaction is the phenomenon that new information is incorporated into stock prices with a delay resulting in a post-event drift. However the cause of this market underreaction remains unclear. According to Bernard and Thomas (1990) market underreaction is a consequence of investors who wrongly believe earnings follow a seasonal random walk process, i.e. future earnings equal corresponding prior period earnings. This argument is based on the finding that a relatively large part of the drift occurs around the next earnings announcement, suggesting the market tends to be surprised. The seasonal random walk model is based on year-to-year comparisons financial media use whenever listed firms publish their earnings information. As a result investors neglect the autocorrelation of in-between quarterly earnings announcements and end up with a naïve expectation model that underestimates the implications of current earnings on future earnings[2]. On the other hand, Ball and Bartov (1996) present a more sophisticated investor who doesn't base his expectations on a

[1] For example, Foster, Olsen & Shevlin,(1984), Bernard & Thomas, (1989, 1990), Liu, Strong & Xu, 2003, Livnet & Mendenhall, (2006).

[2] Bernard and Thomas (1990) show that quarterly earnings surprises exhibit autocorrelation up to four adjacent quarters.

simple seasonal random walk and acknowledges the existence of autocorrelations in unexpected earnings. It is the magnitude of the autocorrelation that is underestimated by the market (by approximately 50%) and this in turn causes market underreaction. Another paper by Chordia and Shivakumar (2005) argues that contrary to bond investors, stock investors underestimate the implication of inflation on future earnings, i.e. the stock market underreacts to inflation information. This can partially explain the underestimation of the magnitude of serial correlation documented by Ball and Bartov (1996).

More recently, several researchers moved towards incorporating behavioral finance as a possible explanation for market underreaction. Behavioral finance assumes investors form biases which might influences their judgment of information, resulting in less than fully rational decisions. For instance, Daniel, Hirshleifer and Subrahmanyam (1998) develop a model of investor behavior based on two well-known psychological findings: overconfidence and self-attribution bias. Overconfidence means investors overestimate the precision of private information signals. Biased self-attribution means investors overweight information that confirms prior beliefs and underweight information that contradicts prior beliefs. Consequently the model predicts that investors underreact to public information. In a contemporaneous paper Barberis, Shleifer and Vishny (1998) develop a model of investor behavior where market underreaction is the result of investors suffering from a conservatism bias, the phenomenon that people only gradually adjust their beliefs to new information (Edwards, 1968). As a consequence investors assume earnings follow a mean-reverting process and underweight the information content of earnings announcements.

Empirical evidence profit warnings

Previous research studying the post-event stock performance following a first-time profit warning signal is limited and concentrated on the US. The most distinct evidence is presented by Bulkley and Herrerias (2005) who studied stock returns following a first-time warning in the US between February 1998 and December (2000). They show that stock returns continue to drift downward up to six months after an initial warning and attribute this evidence to market underreaction. Moreover, they show that the duration and magnitude of the drift is significantly different for qualitative and quantitative warnings. For qualitative warnings the drift lasts about

six months with significant abnormal returns of -11,78%. For quantitative warnings the drift last about three months with significant abnormal returns of -1,98%.

Elayan and Pukthuanthong (2009) studied post-announcement returns following a quantitative warning containing a point estimate in the US between May 1997 and December 2009. The results show significant abnormal returns of -5% the first three months following a warning. In total the drift lasts for approximately eight months.

2.3 Profit warnings

Before we turn our attention to the literature regarding the type of warning issued it is important to improve our understanding of the possible motives that might influence the decision to warn. Important to note is that profit warnings are defined by the literature as voluntarily corporate disclosure.

For instance, Skinner (1994) studied voluntary earnings-related disclosure for 93 randomly chosen NASDAQ firms during the period 1981-1990. The results show that the majority (approximately 67%) of disclosure announcements contain bad news related to the upcoming quarterly earnings announcement. According to Skinner (1994) management issues an earnings warning in order to minimize litigation and reputation costs. Under the US security laws, shareholders have the possibility to sue a firm whenever it fails to disclose bad news in a timely manner. By disclosing bad news as soon as possible firms minimize the time frame for a shareholder to file a lawsuit. Moreover, it is more difficult for shareholders to accuse a firm from withholding bad news when the source of the voluntary disclosure is the firm itself. Baginski, Hassel and Kimbrough (2002) examined the US and Canadian market and found a similar positive influence of litigation risk on the decision to warn. On the other hand, reputation costs arise as market participants are more reluctant to follow a firm which is known to withhold unfavorable news. Consequently, failure to communicate bad news lowers the price and liquidity of a firm's stock price, which increases the cost of capital. In addition, Libby and Tan (1999) interviewed several stock market analysts and conclude they prefer warning firms over non-warning firms. Analysts perceive warning firms as more integer and are more likely to continue coverage. Furthermore analysts indicated that non-warning firms incur more damage to their reputation than warning firms.

Kasznik and Lev (1995) studied information disclosure prior to a large negative 4th quarter earnings surprise between 1988 and 1990. They show that firms tend to issue a warning

when the earnings shortfall has a more permanent nature. All else being equal, they matched warning and non-warning firms and compared the revision in analyst forecasts for the following year. Both the mean and average next year revised forecast were significantly lower for warning firms. A difference they attributed to the permanence shortfall argument. In addition, Kasznik and Lev (1995) found that the probability of a warning is positively related to market capitalization, high-tech or regulated industry membership and the presence of an earlier management forecast, which creates a legal liability to correct the initial statement. Regarding the type of warning issued, they show that as the earning surprise increases the content of a warning contains more earning-related and quantitative information in order to match the level of disappointment. More recently, Xu (2008) extended the permanence shortfall argument by examining operating performance. She shows that warning firms significantly underperform non-warning firms in the following year.

Helbok and Walker (2003) found supporting evidence for the permanence shortfall reason in the UK. On the other hand, they show that the probability of a warning decreases as managerial share ownership and default risk increases. According to Helbok and Walker (2003) the influence of default risk represents a shareholder-bondholder conflict where managers act on behalf of the shareholders by deliberately delaying a profit warning until the mandatory earnings announcement. The influence of managerial share ownership is evidence that security laws partially fail in trying to oblige managers to communicate voluntary disclosure through public channels.

2.4 Quantitative vs. Qualitative warnings

A firm manager has the possibility to choose between a quantitative and a qualitative warning. A quantitative warning is a statement that contains a new numerical revised forecast and is considered to be a precise signal. A qualitative warning is a statement that earnings for a reported period will not meet expectations, i.e. it contains no new numerical revised forecast and is considered to be a less precise signal. Thus it is the decision of a manager to determine the level of information he wants to disclose to the market, a decision that is directly observable for investors.

2.4.1 Disclosure and short-term stock returns

In the short-term the question is whether the disclosure of a less precise signal is interpreted by the market as worse news leading to a more negative market reaction. Most of the research studying the optimal disclosure strategy by managers is based on theoretical model of Milgrom (1981). The theory predicts that the best possible disclosure strategy for an informed manager is the one of full disclosure under the assumption that disclosure is costless and investors are able to detect any withholding of information. Since investors are able to detect any withholding of information partial disclosure is interpreted by investors as worse news and leads to a discounted stock price. In addition, Diamond and Verrecchia (1991) show that firms adopting a higher to degree of disclosure can lower their cost of capital due to reduced information asymmetry, lower transaction costs, and improved liquidity.

Bulkley and Herrerias (2005) implemented the disclosure theory of Milgrom (1981) to profit warnings by examining whether the market reaction is more negative for qualitative warnings. They treat qualitative warnings as partial disclosure since it contains less information and quantitative warnings as full disclosure since it contains more information. According to Bulkley and Herrerias (2005) the choice for a qualitative warning cannot be attributed to an uninformed manager since the type of warning is chosen after they receive information that earnings for a reported period will not meet expectations. Based on this interpretation investors should perceive qualitative warnings as worse news compared to quantitative warnings resulting is a larger negative market reaction at the time of the announcement. However they found no significant different market reaction during an eleven-day event window although the market reaction was slightly more negative for qualitative warnings, respectively – 24,7 % and -20,7 %, Bulkley and Herrerias (2005) conclude that this insignificant difference is evidence that the market does not understand that qualitative warnings are worse news.

In the Netherlands, Church and Donker (2010) also implemented the disclosure theory of Milgrom (1981). The main difference is that they threat firms that hold external factors responsible for the warning as partial disclosure and firms that hold internal factors responsible for the warning as full disclosure. The results show that for repeated warnings the market reaction is weaker for firms adopting a full disclosure policy.

Soffler, Thiagarajan and Walther (2000) focusing on pre-earnings announcements argue that both litigation risk and the market reaction argument provide incentives for a manager to

adopt a full disclosure strategy. They assume that partial disclosure of bad news leads to a second negative surprise at the mandatory earnings announcement date. This second surprise can increase the litigation risk of a firm if investors are able to prove a manager was withholding information at the prior disclosure date. A second argument for a full disclosure theory is based on the market reaction argument. As shown by Libby and Tan (1999) analysts revised forecasts tend to be significantly lower for firms adopting a partial disclosure strategy, i.e. firms who surprise the market at both the pre-earnings and earnings announcement date. According to Sofler et al. (2000) this implies a stronger negative market reaction for a partial disclosure strategy.

On the other hand, Kasznik and Lev (1995) a paper often cited in the profit warning literature document some conflicting findings and statements. They studied all types of voluntary disclosure prior to a negative 4th quarter earnings surprise and compared the market reaction. They concluded that warnings tend to become harder in the form of quantitative and earnings-related information as the magnitude of the earnings surprise increases. Unfortunately Kasznik and Lev (1995) grouped all earnings related warnings together when they compared the market reaction which included both qualitative and quantitative warnings.

2.4.2 Disclosure and market underreaction

In the medium term the question is whether the magnitude of market underreaction depends on the precision of a signal. The behavioral finance theory of Daniel et al (1998) predicts that psychological biases leading to market underreaction are enhanced when the precision of signal decreases. This argument is based on psychological evidence of Einhorn (1980) who show that the overconfidence level of an individual increases as the content of a feedback signal contains vague and indistinct information instead of clear and conclusive information.

Bulkley and Herrerias (2005) implemented the behavioral model of Daniel et al. (1998) for profit warnings by predicting a larger degree of market underreaction for qualitative warnings since it is a less precise signal compared to a more precise quantitative warning. As conjectured they show that over a three month post-event window market underreaction is significantly larger for qualitative warnings compared to quantitative warnings. More specifically, the underreaction lasts for three months for a quantitative warning with significant abnormal returns of – 1,98%. For qualitative warnings the market underreaction lasts for about six months with

significant abnormal returns of – 11,78%. In addition they show that post-event performance is inversely related to firm size, but no influence for different levels of book-to-market ratios.

3. Hypotheses

In this section theoretical and empirical findings from the previous chapter are translated into several testable hypotheses. Section one formulates hypotheses with respect to the short and medium stock price effect of a profit warning announcement. Section two formulates hypotheses regarding the different market reaction between qualitative and quantitative warnings.

3.1 Profit warnings and stock returns

The first objective is to examine the information content of a profit warning announcement by studying the market reaction around the event. According to the efficient market hypothesis (Fama, 1970) stock prices fully reflect all available information and change when new information arrives in the market. A firm that issues a profit warning discloses public information to investors that earnings will fall below expectation. If investors perceive this information as new and value relevant there should be a negative stock price reaction at the time of the announcement. Moreover the relevance of a profit warning is underlined by several studies (Jackson & Madura, 2003; Bulkley & Herrerias, 2005; Church & Donker, 2010), who provide evidence of strong negative abnormal returns at the time of a profit warning announcement.

Hypothesis 1: A profit warning announcement is associated with a negative market reaction in the event window.

The semi-strong efficient market hypothesis suggests that stock prices react quickly in an unbiased matter to public announcements. However, in the literature a vast amount of researchers (Ball & Brown, 1968; Bernard & Thomas, 1989, 1990 among others) provide evidence that stock returns continue to drift downward after a negative earnings surprise reported at the scheduled earnings announcement date. The predominant explanation for this phenomenon is that markets underreact to new information. Since profit warnings can be classified as unscheduled earnings information containing a surprise it is interesting to see whether there is a similar drift. In addition, Bulkley and Herrerias (2005) provide evidence of market underreaction following a profit warning in the US.

Hypotheses 2: Abnormal returns continue to drift downward in the month following a profit warning signal.

3.2 Type of warning and stock returns

A firm manager has the possibility to choose between two types of warnings: qualitative or quantitative statements. A quantitative warning is a statement that contains a new numerical revised forecast and is considered to be a precise signal. A qualitative warning contains no new numerical revised forecast and is considered to be a less precise signal. Based on this notion it is interesting to see whether the type of warning influences the market reaction. The theoretical model of Milgrom (1981) predicts that the optimal disclosure strategy for an informed manager is the one of full disclosure under the assumption that disclosure is costless and investors are able to detect any withholding of information. Since investors detect any withholding of information partial disclosure is interpreted as worse news and leads to a discounted stock price. Bulkley and Herrerias (2005) translated this theory to the type of warning issued. They treat qualitative warnings as partial disclosure since they contain less information and quantitative warnings as full disclosure since they contain more information.

Hypothesis 3: In the event window the market reaction is more negative for qualitative warnings compared to quantitative warnings.

If stock returns continue to drift downward after a profit warning signal it interesting to see whether the magnitude of this drift differs for qualitative and quantitative warnings. The behavioral theory of Daniel et al. (1998) predicts that psychological biases leading to market underreaction are enhanced when the precision of a signal decreases. Consistent with this theory Bulkley and Herrerias (2005) show that market underreaction is significantly more negative for less precise qualitative warnings compared to more precise quantitative warnings.

Hypothesis 4: The magnitude of the drift is more negative for qualitative warnings compared to quantitative warnings.

4. Data and Methodology

This section describes the data and methodology of this research. At first section one describes the concept of profit warnings in more detail. Next section two describes the data collection process including some descriptive statistics. The third section describes the event study methodology which is divided in a short and medium term event window. Finally section four describes the univariate and multivariate regression analysis which is used to compare the market reaction between quantitative and qualitative warnings.

4.1 Profit Warnings

A profit warning is a public announcement saying that earnings for a reported period will not meet expectations. Firm managers tend to issue a profit warning when previous forecasts are believed to be too optimistic or unforeseen changes in economic or operational conditions have occurred. The content of the shortfall may be in terms of net profits, sales, and earnings before interest and taxes etc. The warning is issued prior to the mandatory scheduled earnings announcement. The Euronext Amsterdam listing and issuing rules (article 28h) obliges firms to immediately disclose price sensitive information regarding any facts or events which are expected to have a significant effect on the stock price. Based on this rule firms are required to issue a profit warning as soon as possible whenever a new expectation significantly deviates from a previous expectation. Firm managers have the possibility to choose between a quantitative warning, which includes a numerical revised forecast in the form of a point or range estimate, and a qualitative warning, which is a statement that earnings will not meet expectations.

4.2 Data

The sample of profit warnings is based upon firms listed at Euronext Amsterdam between January 2001 and December 2007. Profit warning announcements are collected from the Lexis Nexis database, which contains articles from various newspapers in the Netherlands. For each warning, information concerning the announcement date and type (quantitative or qualitative) of warning is collected. The initial sample contains a total of 210 profit warnings issued between January 2001 and December 2007. However each warning firm must meet certain criteria in order to be included in the final sample.

First of all several statements were eliminated from the sample due to confounding events such as possible takeovers news, liquidity problems etc. Second of all during the sample period it is not uncommon for firms to issue more than one profit warning. "Repeated warnings are excluded because overlapping multi-month returns mean that their inclusion would result in a double counting of returns from some companies and hence biased statistical inference" (Bulkley & Herrerias, 2005, p. 605)[3]. Moreover, Jackson and Madura (2007) show that the market reaction is significantly smaller for repeated warnings issued within two years of a first warning. Therefore any repeated warning issued within two years of a first warning is excluded from both the event and the post-event sample. Next, for each firm several data items used in an event study and regression analysis need to be available in Thompson DataStream:

- Daily stock prices, market value of equity and market-to book ratios.
- Accounting figures regarding total assets, total liabilities, and earnings before interest and taxes all reported at the year-end prior to a profit warning. Based on these figures leverage can be calculated as the ratio of total liabilities and total assets. Basic earnings power is calculated as the ratio of earnings before interest and taxes and total assets.
- Information regarding the type of industry, which is based upon the FTSE/DJI Industry Classification Benchmark (ICB).
- Daily returns on the Amsterdam All Share Index, which is a weighted index based on stock prices of all eligible firms listed at Euronext Amsterdam.

[3] The sample period of Bulkley and Herrerias (2005) is approximately two years

4.3 Descriptive statistics

After the above selection procedure a total of 117 first-time profit warnings remain available for analysis. Table 1 describes several descriptive statistics for this remaining sample.

Table 1: Descriptive Statistics

The sample period is based upon firms listed at Euronext Amsterdam between January 2001 and December 2007. QN represent the group of firms that issued a quantitative warning. QL represents the group of firms that issued a qualitative warning.

Year	All	QL	QN
2001	45	11	34
2002	19	4	15
2003	17	8	9
2004	8	3	5
2005	10	2	8
2006	11	3	8
2007	7	4	3
Total	**117**	**35**	**82**

As shown by table 1 the number of profit warning announcements differs substantially across the sample period. In 2001 the number of warnings reached its peak containing 38% of the total sample. This high percentage can potentially be explained by two factors. First of all, profit warnings issued in the first year cannot be labeled as repeated warnings since 2001 represents the beginning of the sample period. Moreover in March 2001 the dot-com bubble exploded and led the Dutch economy into recession, which probably influenced the number of profit warning announcements. Furthermore approximately 30 % of the sample consists of qualitative warnings, which is higher than the 21% reported by the US sample of Bulkley and Herrerias (2005). Next Panel A and B of table 2 present the number of profit warnings by quarter and industry.

Table 2: Number of profit warning by quarter and industry

QN represent the group of firms that issued a quantitative warning. QL represents the group of firms that issued a qualitative warning. The distribution of profit warning by industry is based upon the FTSE/DJI Industry Classification Benchmark (ICB).

Panel A: Number of profit warnings by quarter

Year	**All**	QL	QN
Q1	14	14,29%	10,98%
Q2	31	22,86%	28,05%
Q3	30	31,43%	23,17%
Q4	42	31,43%	37,80%
Total	**117**	**100%**	**100%**

Panel B: Number of profit warnings by industry

Industry	**All**	**QL**	**QN**
Oil&Gas	2	0,00%	2,44%
Basic Materials	8	2,86%	8,54%
Industrial	44	31,43%	40,24%
Consumergoods	11	17,14%	6,10%
Healthcare	1	0,00%	1,22%
Consumer Service	17	17,14%	13,41%
Telecommunications	0	0,00%	0,00%
Utilities	0	0,00%	0,00%
Financial	11	5,71%	10,98%
Technology	23	25,71%	17,07%
Total	**117**	**100,00%**	**100,00%**

Panel A of table 2 shows that the majority of warnings are issued in the fourth quarter. Panel B of table 2 shows that a relatively large portion of profit warnings are issued by firms operating in the industrial sector, which is consistent with the extant literature. Next table 3 shows the summary statistics for the total sample of first-time profit warnings.

Table 3: Summary Statistics

MTB is the market-to-book ratio, TA is total assets, TL is total liabilities, EBIT is earnings before interest and taxes. BEP represents the basis earnings power of a firm, which is the ratio between EBIT and TA, LEV is the leverage of firm, which is the ratio of TL and TA. All data is based upon the corresponding values reported at the end of the year prior to a profit warning.

	Mean	Median	STD
MTB	2,90	1,94	3,34
TA	15276,40	510,06	81585,21
TL	13928,38	330,84	78234,49
LEV	0,61	0,65	0,21
EBIT	549,54	42,15	2738,64
BEP	0,08	0,08	0,09

As shown by table 3 average values are much larger than median values for all variables expect leverage and basic earnings power. This is probably the influence of a few very large firms. The median size of an event firm measured by total assets is about 510 million euro's reported at the year-end prior to the warning. The median market-to-book ratio is 1,94, which is slightly lower than the 2,39 documented by Elayan and Pukthuanthong (2009). Leverage as the ratio between total liabilities and total assets is on average 65%. Basic earnings power measured as the ratio between EBIT and total assets is on average 8%.

4.4 Methodology

The effect of a profit warning announcement on the value of firm is measured by conducting an event study. In addition, it allows a researcher to examine whether there is rational market reaction by studying post-event performance. Furthermore a univariate and multivariate regression analysis is employed to compare the market reaction between quantitative and qualitative warnings.

4.4.1 Event study

De Jong and de Goeij (2009) identified three steps a researcher has to perform in order conduct an event study: identify the event, specify a benchmark model for normal return and calculate and analyze abnormal returns.

Step 1: Event Definition

The first step is to determine the event and window of interest. The event day represents the day of the profit warning announcement and is denoted as t=0. Important to note is that several event dates are adjusted to account for problems such as after closing or weekend announcements. If the date of the profit warning cannot be determined precisely the publishing date of the newspaper article is chosen.

The event window is further divided in a short and medium-term. The short-term window consists of an eleven trading day period (-5, + 5) surrounding the announcement. To increase our understanding about the impact of the event several sub windows are introduced, which include the day of the announcement (t=o), the week before (-5,-1) and after (1,5) the event. The medium-term period consists of a twelve month window starting the second day after the initial announcement. This should give us clear indication whether stock returns continue to drift downward.

Step 2 and 3: Specify a benchmark model, calculate and analyze abnormal returns

The information value of an event is measured by calculating abnormal returns, which is the difference between the actual and normal rate of return. The normal return is defined as "the expected return without conditioning on the event taking place" (MacKinley, 1997, p. 15).
The most important step of an even-study is to specify the benchmark model for computing the normal rate of return. In the short-term the benchmark equals a market model. In the medium-term two benchmark models are implemented: a control firm similar in size and market-to-book and a market model. To abstract the influence of extreme outliers both the event and post-event results are winsorized at the 2% level.

Short-term event window

Daily abnormal returns for a single event firm are calculated using the following formula[4]:

$$AR_{it} = \mathrm{R_{it}} - \mathrm{NR_{it}} \qquad (1)$$

Where:

[4] Equations are taken from De Jong and De Goeij (2009)

AR_{it} = abnormal return of stock i on trading day t

R_{it} = actual return of stock i on trading day t

NR_{it} = normal of return of stock i on trading day t

In the short-term the market model is used as a benchmark for normal return behavior, where abnormal returns are equal to the residuals of this model.

$$NR_{it} = \hat{\alpha}_i + \hat{\beta}_i(R_{m\,t} - r_{f\,t}) \quad (2)$$

Where:

$NR_{i,t}$ = normal return of stock i on trading day t

$R_{m,t}$ = market return on trading day t

α ,β = coefficients in the model for stock *i*

The market return equals the return on the Amsterdam All Share Index, which is a weighted index based on stock prices of all eligible firms listed at Euronext Amsterdam. The coefficients for the market model are calculated by a running an ordinary least squares (OLS) regression based on historical price data of stock i and the market index. For this analysis an estimation window of 200 trading days prior to the event (-221, -21) is used as a proxy for historical price data.

Next, equally weighted averaged abnormal returns ((AAR) are calculated. The equally weighted abnormal returns are used since it is the objective to measure the average effect of an event.

$$AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{i,t} \quad (3)$$

In order to account for periods longer than one day, daily abnormal returns are cumulated (CAR) for each firm.

$$CAR_i = \sum_{t=t_1}^{t_2} AR_{i,t} \quad (4)$$

Subsequently, CARs for the total sample are summed and averaged.

$$CAAR = \frac{1}{N} \sum_{t=t_1}^{t_2} CAR_i \quad (5)$$

Post-event returns

Measuring post-event performance should indicate whether abnormal returns continue to drift downward after a profit warning announcement, i.e. it is a test of market efficiency. At the moment there are two dominant methods that are used to calculate post-event abnormal performance: buy-and-hold abnormal returns (BHAR) and cumulating abnormal returns (CAR). Barber and Lyon (1997) recommend the use of the BHAR method as it is more realistic representation of an investor experience compared to the CAR method. A downfall of the method is based on the bad model problem addressed by Fama (1998), which means that systematic measurement errors due to imperfect benchmark models are compounded under the BHAR method. On the other hand Barber and Lyon (1997) show that these problems typically occur for periods between three and five years whereas in this study the event period is limited to one year. The BHAR is the difference between the holding period return of an event firm and the holding period return of a benchmark firm and can be calculated using the following formula:

$$BHAR = \prod_{t=1}^{t}(1 + R_{i,t}) - \prod_{t=1}^{t}(1 + R_{b,t}) \quad (1)$$

Important to note is that daily returns are used to calculate monthly returns, and one month consists of 21 trading days. Subsequently, BHARs for all event firms are summed and averaged.

$$BHAAR = \frac{1}{N} \sum_{t=t_1}^{t_2} BHAR_i \quad (2)$$

In addition raw buy-and-hold returns (BHR) are calculated which should provide additional evidence of post-event drift, although it is the most extreme test case of market

inefficiency (Tafler, Lu & Kausar, 2004). The following formula can be used to calculate raw buy-and-hold returns:

$$BHR = \prod_{t=1}^{t}(1 + R_{i,t}) - 1 \quad (3)$$

Next, a benchmark model has to be selected as a proxy for normal return behavior in the medium-term. Following the work of Barber and Lyon (1997) and Ang and Zhang (2004) a single control firm similar in size and market-to-book is adopted as a proxy for normal return. As indicated by Barber and Lyon (1997) the single control firm eliminates the new listing bias, the rebalancing bias and the skewness bias[5]. Furthermore both studies show that tests of long-term abnormal performance are well specified when the benchmark equals a single control firms similar in size and market-to-book value. The matching procedure for all event firms is as follows. First the database excludes all firms as a possible match that issued a profit warning within 1,5 year of an event firm. Next, on December 31 of each year all firms are ranked based upon their market value of equity and market-to book ratio. Then, a two factor approach first identifies all firms with a market value of equity between 70% and 130% of the market value of equity of an event firm. Subsequently a control firm is chosen with a market-to-book ratio closest to that of an event firm. For an event firm the market value of equity and market-to-book ratio is equal to the corresponding values on the second day after the announcement[6]. Firms that delisted within the event period are not replaced, i.e. subsequent results reflect a smaller sample[7]. If a control firm delists within the sample period it is replaced by a different control firm. For robustness a second benchmark is introduced which consist of a market model similar to the one used in the short-term.

[5] New listing bias is eliminated since both the event and control firm are listed at the time of matching. Rebalancing bias is eliminated since the BHAR method requires no rebalancing. Skewness bias is elimented because the probability of extreme positive returns is equal for event and control firm.
[6] This method is similar to the one used by Bulkley and Herrerias (2005).
[7] Elayan and Pukthuanthong (2009) use a similar technique in calculating long-term abnormal returns. Moreover, the influence of this technique is minimal since there are only two firms that delisted within the post-event window.

Statistical Testing

A basic t-test is introduced to test whether abnormal returns (AAR, CAAR and BHAAR) are statistically different from zero. The restrictions underlying this test include the assumption that abnormal returns are independently and identically distributed and abnormal returns follow a normal distribution with a mean of zero and variance σ^2. Since the variance is unknown it is estimated form the cross-sectional variance of abnormal returns.

4.4.2 Regression analysis

In order to study the difference between quantitative and qualitative warnings a univariate and multivariate regression analysis is conducted. First, a univariate analysis compares the mean difference between the two types of warnings using an independent sample t-test. Next, a multivariate regression analysis is employed to examine whether the results are robust after controlling for several factors used in prior literature that might explain the magnitude of the market reaction. The dependent variables consist of various CARs and BHARs from the accompanied event windows. Important to note is that BHARs are based upon the single control firm benchmark.

Regression model short term:

1. $CAR_{i,(t-n,t+n)} = \alpha + \beta_1 QL_i + \beta_2 LNMV + \beta_3 MTB + \beta_4 HTECH + \beta_5 BEP + \beta_6 LEV + \epsilon$

and

Regression model medium term:

2. $BHAR_{i,(t-n,t+n)} = \alpha + \beta_1 QL + \beta_2 LNMV + \beta_3 MTB + \beta_4 HTECH + \beta_5 BEP + \beta_6 LEV + \varepsilon$

Qualitative warning

The key independent variable is the type (quantitative or qualitative) of warning issued.
A dummy variables is introduced that equals one for a qualitative warning (QL) and zero otherwise. The sign of the dummy variable is expected to be negative.

Control Variables

This subsection discusses several important factors used in prior research and their predicted sign in relation to the dependent variable. Important to note is that the sign of the independent variables are similar in both regression analysis (short and medium-term).

Size

Several studies (Jackson & Madura, 2003; Bulkley & Herrerias, 2005; Church & Donker, 2010; Elayan & Pukthuanthong, 2009) document a smaller market reaction for larger firms. According to Elayan and Pukthuanthong (2009) investors perceive larger firms as less risky and therefore the market devaluation is smaller. Jackson and Madura (2003) argue that larger firms receive more analysts' coverage, thereby reducing the element of surprise in case of a profit warning. Market value of equity (LNMV) is taken as a proxy for size, and is predicted to have a positive influence, i.e. larger firms suffer less from a profit warning. The natural log is taken since this variable is typically skewed.

Information asymmetry

According to Elayan and Pukthuanthong (2009) the information content of a profit warning increases as the level of information asymmetry between managers and investors increases. As conjectured they show that several variables representing the level of information asymmetry negatively influence the market response around a profit warning. Similar to their study, market-to-book ratio (MTB) and high tech industry membership (HTECH) are included as proxies for the level of information asymmetry. MTB is often used in the literature to indicate the growth opportunities of a firm. Since firm managers have superior information regarding their growth potential higher market-to-book ratios should represent a higher level of information asymmetry between investors and managers. For HTECH firms investors are usually more focused on future potential than current performance. Thus, both variables are expected to have a negative influence on the market reaction. For HTECH a dummy variable is included that equals one for high-tech firms according to the FTSE/DJI Industry Classification Benchmark and zero otherwise.

Leverage

Highly leveraged firms are perceived by the market as more risky. According to Elayan and Pukthuanthong (2009) this risk increases if a firm needs to issue a profit warning, indicating there is an inverse relation between leverage and stock returns. Thus, leverage (LEV) is expected to have a negative effect on the market reaction, and is equal to the ratio of total liabilities and total assets.

Basic earnings power

The final variable is basic earnings power (BEP) and indicates the basic profitability of assets. According to Elayan and Pukthuanthong (2009) firms with higher levels of basic earnings power should suffer less form a profit warning. Consistent with this thought they document a significant inverse relationship between the market reaction and basic earnings power. Basic-earnings power is measured as the ratio of earnings before interest and taxes (EBIT) and total assets (TA).

Correlation matrix

Table 4 presents the correlation matrix, which consists of the six previously described explanatory variables.

Table 4: Correlation matrix

	QL	MTB	HTECH	LN TA	LEV	BEP
QL	1,00	-0,05	0,10	0,03	0,03	-0,03
MTB		1,00	0,32	-0,06	0,02	0,25
HTECH			1,00	-0,20	-0,19	0,00
LN TA				1,00	0,48	-0,09
LEV					1,00	-0,32
BEP						1,00

As shown by table 4 all values lie beneath the 0,5 indicating there is no strong relationship between any of the variables. The highest correlation of 0,48 is between LNTA and LEV of 0,48. This is not a surprising relationship since larger firms typically have easier access to external capital and are perceived by the market as less risky which enables them to obtain higher levels of debt.

5. Empirical Results

In section five results from the empirical research are presented and discussed. Section one starts with the results of the event study for the short and medium-term event window. Next, section two presents and discusses the results of a univariate and multivariate regression analysis for both the short and medium term.

5.1. Short-term stock returns

The first period to be examined is an eleven-day event window starting five days before the announcement, which should provide a clear indication whether profit warnings are associated with negative abnormal returns. Panel A and B of table 5 presents the abnormal returns in an eleven-day announcement window.

Table 5: Abnormal returns – event window

Daily abnormal returns (ARs) are calculated as the difference between the actual and normal return of an event firm, where a market model is used as a proxy for normal return. AR's are further cumulated (CAR) to match different event windows. A parametric t-test is used to test whether abnormal returns are statistically different from zero. To abstract the influence of extreme outliers results are winsorized at the 2% level.

Panel A: Average abnormal returns (AAR)

AAR	**N**	**Mean**	**T-stat**	**STDEV**	**Median**
-5	117	0,13%	0,207	1,92%	-0,05%
-4	117	0,37%	2,017*	1,99%	0,16%
-3	117	-0,01%	-0,081	2,00%	-0,01%
-2	117	0,28%	1,058	2,82%	-0,02%
-1	117	-0,38%	-1,460	2,80%	-0,16%
0	117	-7,82%	-11,277***	7,50%	-6,27%
1	117	-0,79%	-2,832***	3,02%	-0,48%
2	117	-0,05%	-0,213	2,66%	0,03%
3	117	0,10%	0,494	2,28%	-0,01%
4	117	-0,38%	-1,616	2,51%	-0,24%
5	117	-0,21%	-0,941	2,43%	-0,06%

*** Statistically significant at the 1% level

** Statistically significant at the 5% level

* Statistically significant at the 10% level

Panel B: Cumulative average abnormal returns (CAAR)

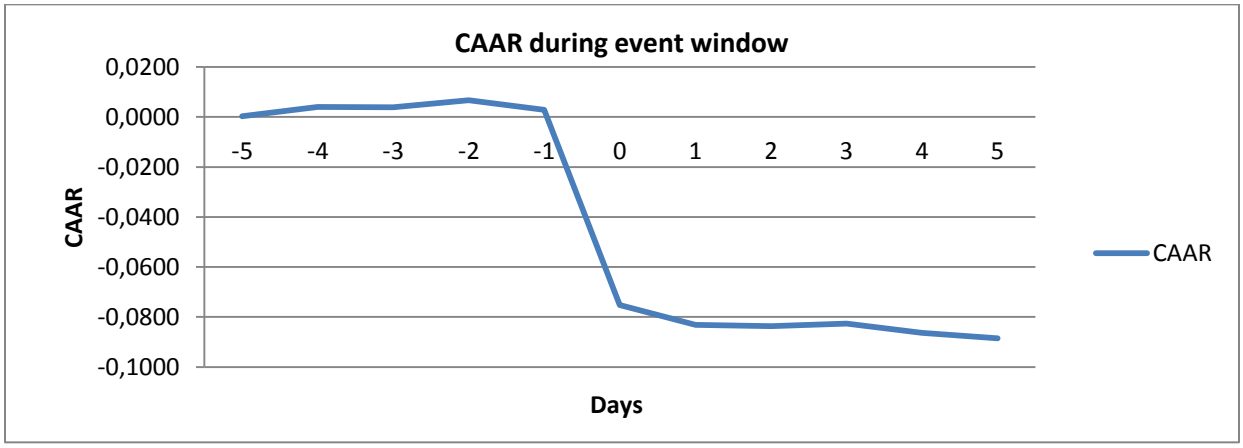
CAAR	N	Mean	T-stat	STDEV	Median
(-1, 1)	117	-8,66%	-7,239***	12,94%	-7,35%
(-5, +5)	117	-8,79%	-7,197***	13,21%	-7,28%
(-5, -1)	117	0,25%	0,591	4,55%	0,24%
(1, +5)	117	-1,45%	-2,678***	5,87%	-1,34%

*** Statistically significant at the 1% level

** Statistically significant at the 5% level

* Statistically significant at the 10% level

Figure 1: Cumulative average abnormal returns (CAAR) – event window



Panel A and B of table 5 show that profit warning announcements elicit a large negative market reaction in the event window. On the day of the announcement the AAR is -7,82%, and significant at the 1% level. In an eleven-day event window (-5, 5) the CAARs is -8,79% and significant at the 1% level. In addition, figure one graphically displays how the market reaction evolves at the time of a warning and clearly shows the big impact of these announcements. A closer look at the results shows that profit warnings seem to surprise the majority of investors with insignificant ARs and CARs prior to the announcement. This differs from evidence in the US where abnormal returns are significantly negative during many prior announcement days (Bulkley & Herrerias, 2005; Elayan & Pukthuanthong, 2009). On the other hand consistent with these studies post-event results indicate there is an incomplete market reaction. On the day after

the warning the AAR is -0,79%, which is significant at the 1% level, and over the complete post-event week (1,5) the CAAR is -1,45%, which is significant at the 1% level.

Overall the results clearly support the notion that profit warnings are value relevant events that are followed by large negative abnormal returns in the announcement window. Moreover the results are consistent with previous research in the US and Netherlands (Bulkley & Herrerias, 2005; Elayan & Pukthuanthong, 2009; Church & Donker; 2010).

5.2 Medium term stock returns

The following section examines whether post-event returns continue to drift downward after a profit warning announcement. First abnormal returns are presented, which are followed by raw returns. Table 6 presents average buy-and-hold abnormal returns (BHAAR) from the second day (t+2) to twelve months after a first-time profit warning. The benchmark consists of a single control firm similar in size and market-to-book (SCF), and a market model (MM).

Table 6 Abnormal returns –post-event window

Monthly returns are calculated using daily data and one month consists of 21 trading days. Two benchmark models are included: a single control firm similar in size and market-to-book ratio (SCF), and a market model (MM). The selection procedure for a single control firm is described in section four. A parametric t-test is used to test whether BHAAR are statistically different from zero. To abstract the influence of extreme outliers results are winsorized at the 2% level.

Month	N	Bechmark	BHAAR	T-stat	STDEV	Median
1	117	1. SCF	-1,63%	-1,17	15,03%	-2,11%
	117	2.MM	-0,50%	-0,43	12,58%	-2,26%
2	117	1. SCF	-4,08%	-2,38**	18,57%	-2,98%
	117	2.MM	-1,79%	-1,32	14,66%	-3,82%
3	117	1. SCF	-6,95%	-3,34***	22,52%	-4,04%
	117	2.MM	-3,92%	-2,15**	19,70%	-0,50%
4	117	1. SCF	-8,21%	-3,43***	25,91%	-7,29%
	117	2.MM	-4,20%	-2,25**	20,18%	-3,18%
5	117	1. SCF	-9,23%	-3,60***	27,75%	-5,41%
	117	2.MM	-4,52%	-2,06**	23,73%	-3,79%
6	117	1. SCF	-11,62%	-3,80***	33,12%	-3,20%
	117	2.MM	-4,45%	-1,93*	25,00%	-3,79%
7	116	1. SCF	-11,89%	-3,72***	34,44%	-7,61%
	116	2.MM	-5,45%	-2,14**	27,50%	-1,92%
8	115	1. SCF	-12,33%	-3,68***	35,91%	-8,61%
	115	2.MM	-5,23%	-1,98**	28,27%	-5,97%
9	115	1. SCF	-11,77%	-3,41***	37,05%	-9,59%
	115	2.MM	-3,73%	-1,36	29,32%	-4,27%
10	115	1. SCF	-11,53%	-3,21***	38,48%	-9,91%
	115	2.MM	-4,56%	-1,51	32,39%	-5,84%
11	115	1. SCF	-11,68%	-3,25***	38,61%	-12,04%
	115	2.MM	-5,15%	-1,63	33,91%	-6,50%
12	115	1. SCF	-12,22%	-3,38***	38,81%	-9,98%
	115	2.MM	-6,05%	-1,80*	36,14%	-6,66%

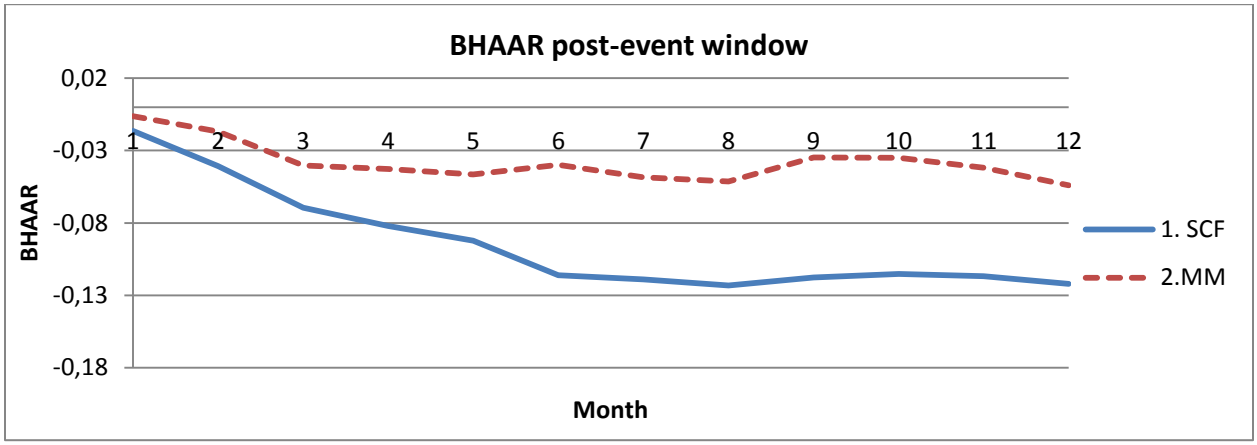
*** Statistically significant at the 1% level

** Statistically significant at the 5% level

* Statistically significant at the 10% level

Figure 2: Average Buy-and hold abnormal returns (BHAAR) – post-event window

Figure two graphically displays the development of buy-and-hold abnormal returns up to twelve months .The benchmark consists of a single control firm (SCF) and a market model (MM).



As shown by table 6 firms issuing a first-time profit warning exhibit substantial negative abnormal returns one year after the announcement. The results are significant for both benchmark models and ranges from -12,22% for model one to -6,05% for model two. For model one BHAARs are significantly negative in all post-event months except the first month. Furthermore the magnitude of drift reaches its peak in the eight month with a BHAAR of -12,33%, which is significant at the 1% level. For model two BHAARs are significantly negative from the third to the eight month and the twelfth month. The drift reaches its peak in last month. In addition, figure 2 graphically displays how the market reaction develops under both models, and clearly displays the evidence of post-event drift. The beginning of the post-event period shows that the BHAAR is insignificant in the first month for model one and insignificant in the first two months for model two. This is consistent with the findings of Bulkley and Herrerias (2005) in the US, where the BHAAR is insignificant in the first month. On the other hand the length and magnitude of the drift differs. In the study of Bulkley and Herrerias (2005) the drift lasts for six month and reaches a maximum BHAAR of -11,78%, whereas in this study the drift lasts the entire twelve months and reaches a maximum BHAAR of -12,33%.

Overall the results for both benchmark models support the notion that abnormal returns continue to drift downward after a profit warning signal, which is consistent with the findings of Bulkley and Herrerias (2005) in the US. On a broader perspective, the results are consistent with the evidence of post-event drift following a negative earnings surprise reported at the scheduled

earnings announcement. However the degree of market underreaction is much larger. For instance, Bernard and Thomas (1990) document a CAR of -2,3% for the group with the largest negative earnings surprise in a 60 day post-event period.

Raw Returns

In addition to abnormal returns, raw returns should provide additional evidence of post-event drift, although it is the most extreme test case of market inefficiency (Tafler et al., 2004). Table 7 presents average raw buy-and-hold returns (BHR) from the second day (t+2) to twelve months after a first-time profit warning.

Table 7: Post-event raw returns

Monthly returns are calculated using daily data and one month consists of 21 trading days. A parametric t-test is used to test whether BHR are statistically different from zero. To abstract the influence of extreme outliers results are winsorized at the 2% level.

Month	N	BHR	T-stat	STDEV	Median
1	117	-0,27%	-0,21	14,25%	-0,31%
2	117	-1,48%	-0,99	16,22%	-1,43%
3	117	-5,26%	-2,70***	21,10%	-1,32%
4	117	-5,98%	-3,06***	21,18%	-3,82%
5	117	-6,43%	-2,88***	24,11%	-4,83%
6	117	-7,97%	-3,12***	27,63%	-5,28%
7	117	-8,48%	-3,24***	28,29%	-4,29%
8	117	-8,02%	-2,78***	31,24%	-5,57%
9	117	-7,10%	-2,45**	31,39%	-5,73%
10	117	-8,49%	-2,69***	34,12%	-8,12%
11	117	-9,41%	-2,96***	34,37%	-9,06%
12	117	-10,18%	-3,22***	34,22%	-8,77%

*** Statistically significant at the 1% level

** Statistically significant at the 5% level

* Statistically significant at the 10% level

The results of table 7 show no major deviation in raw returns for event firms and support the notion that stock returns continue to drift downward after a profit warning signal. In a one

year post-event window raw returns are -10,18%, and significant at the 1% level. The only difference is seen at the beginning of the period where raw returns are insignificant during the first two months, whereas abnormal returns are insignificant in the first month.

5.3. Quantitative vs. Qualitative returns

This section presents and discusses the results between qualitative and quantitative warnings. More specifically it examines whether qualitative warnings induce a more negative market reaction compared to quantitative warnings.

5.3.1 Univariate analysis – short-term

Table 8 shows the results for a univariate analysis which compares the short-term market reaction between firms issuing a quantitative and firms issuing a qualitative warning.

Table 8: Univariate analysis – event window

Daily abnormal returns (AR) are calculated as the difference between the actual and normal return of an event firm, where a market model (MM) is used as a proxy for normal return. AR's are further cumulated (CAR) to match different event windows. An independent sample t-test is used to test whether the mean difference is significant. QL represents the group of firms that issued a qualitative warning. QN represents the group of firms that issued a quantitative warning.

		N	Mean	T-stat	Mean difference	Difference of means T-stat
Car (0)	1. QN	82	-7,51%	-8,71***	-1,19%	-0,77
	2. QL	35	-8,71%	-6,79***		
Car (-5, +5)	1. QN	82	-10,17%	-6,71***	4,82%	1,80*
	2. QL	35	-5,35%	-2,63**		
Car (-5, -1)	1. QN	82	-0,45%	-0,91	2,42%	2,65***
	2. QL	35	1,97%	2,57**		
Car (1, +5)	1. QN	82	-2,12%	-3,30***	2,45%	2,02**
	2. QL	35	0,33%	0,30		

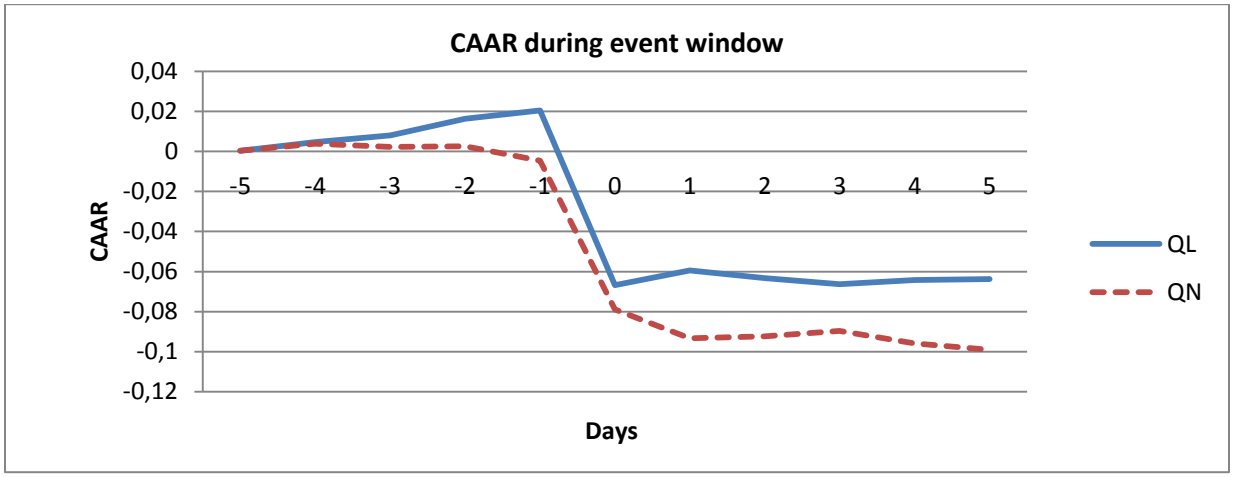
*** Statistically significant at the 1% level

** Statistically significant at the 5% level

* Statistically significant at the 10% level

Figure 3: Cumulative average abnormal returns (CAAR) – event window.

QL represents the group of firms that issued a qualitative warning. QN represents the group of firms that issued a quantitative warning.



As shown by table 8 on the day of the announcement the mean difference is as expected 1,19% more negative for qualitative warnings, but the result is insignificant. On the other hand results for the remaining three event windows indicate a positive influence of qualitative warnings. During an eleven-day announcement window the market reaction is on average 4,82% less negative for qualitative warnings, which is significant at the 10% level. The pre-event week shows a less pronounced reaction of 2,42%, significant at the 5% level, and the post-event week a less pronounced reaction of 2,45%., significant at the 5% level. In addition, figure 3 graphically shows how the market reaction develops for both types of warnings. Overall the results do not support the notion that qualitative warnings induce a more negative market reaction in the event window, on the contrary it seems there is a less negative reaction.

5.3.2. Multivariate Regression analysis – short-term

Next, a multivariate regression analysis examines whether the above results are robust after including several control variables used in prior literature that might explain the magnitude of the market reaction. The dependent variable consists of various CARs from the event window. In the model a dummy variable is included that equals one if a firm issued a qualitative warning (QL) and zero if a firm issued a quantitative warning. The control variables include: firm size (LNTA), market-to-book (MTB), high-tech industry membership (HTECH), leverage (LEV), and basic earnings power (BEP). Table 9 presents the results for the regression analysis.

Table 9 Multivariate regression analysis - event window

To abstract the influence of extreme outliers CARs are winsorized at the 2% level. QL is a dummy variable that equals one for qualitative warnings and zero otherwise. LN MV is the natural log of total assets. MTB is the market-to-book ratio. HTECH is dummy variable that equals one for high-tech industry membership and zero otherwise. BEP represents the basis earnings power of a firm, which is the ratio between earnings before interest and taxes and total assets. LEV is the leverage of firm, which is the ratio of total liabilities and total assets. Data for independent variables are based upon the corresponding values reported at the end of the year prior to a profit warning.

		AR (0)	Car (-5, +5)	Car (-5, -1)	Car (1,+5)
Intercept	Coefficient	-0,064	-0,206	-0,030	-0,130
	P-value	0,132	0,005***	0,207	0,000***
QL	Coefficient	-0,009	0,042	0,022	0,018
	P-value	0,575	0,119	0,016**	0,112
MTB	Coefficient	0,000	-0,002	-0,003	0,001
	P-value	0,836	0,633	0,053*	0,716
HTECH	Coefficient	-0,044	0,016	0,008	0,039
	P-value	0,027**	0,638	0,466	0,006**
LN MV	Coefficient	-0,001	0,010	0,004	0,008
	P-value	0,815	0,089*	0,038**	0,001***
LEV	Coefficient	0,024	-0,018	-0,037	-0,001
	P-value	0,572	0,800	0,125	0,962
BEP	Coefficient	-0,114	-0,105	0,037	-0,055
	P-value	0,175	0,469	0,445	0,359
F-stat		1,66	1,26	2,91**	4,42***
adj R^2		3,30%	1,34%	9,01%	15,04%
N		117	117	117	117

*** Statistically significant at the 1% level

** Statistically significant at the 5% level

* Statistically significant at the 10% level

As shown by table 9 the influence of QL decreases after including several control variables. The coefficient for QL is now insignificant in both the complete (-5,5) and post-week (1,5) event window. The result for the pre-event week (-5,-1) is robust with a positive coefficient of 0,022 significant at the 5% level. This indicates that the market is more surprised when it observes a qualitative warning.

Additional results show that the coefficient for market-to-book ratio (MTB) is negative (-0,003) and significant at the 10% level the week prior to the event (-5,-1), which is consistent with my expectation. For high-tech firms (HTECH) the results are mixed. On the day of the announcement the coefficient for HTECH is -,044, which is significant at 5% level. On the other hand the coefficient is positive (0,039) and significant at the 1% level in the week following the warning. It seems the market overreacts to high-tech firms on the day of the warning, a reaction that is corrected in the following days. Given the mixed results for HTECH it is difficult to conclude that firms with higher levels of information asymmetry suffer more from a profit warning as shown by Elayan and Pukthuanthong (2009).

Size (LNMV) has a significant influence in all event windows except on the day of the announcement (0). The sign of the coefficient is positive in all three windows, which is consistent with my prediction and the findings of Church and Donker (2010) in the Netherlands. As indicated two possible explanations for this positive influence is the notion that larger firms are perceived by the market as less risky (Elayan & Pukthuanthong, 2009), and they receive more analysts coverage which reduces the element of surprise in case of a warning (Jackson & Madura, 2003).

Finally the results show no significant influence of leverage (LEV) and basic earnings power (BEP) during any of the event windows. In case of leverage this in consistent with the findings of Church and Donker (2010) in the Netherlands. For BEP the coefficient is negative but insignificant on the day (0) of the warning and in the complete (-5,5) event window, which is the opposite of my predictions and the findings of Elayan and Pukthuanthong (2009). Although the result is insignificant it could be an indication that the market is more disappointed when firms with higher levels of basic earnings power have to issue a profit warning,

Overall the results do not support the disclosure theory of Milgrom (1981) and the findings of Bulkley and Herrerias (2005) in the US that qualitative warning are worse news, although they found no significant influence. On the contrary the results point more towards a less negative market reaction. However the question remains why firms choose to issue a qualitative warning if theoretical models predict the opposite influence on the market reaction. It could be that there are other predominant factors that determine whether or not a firm issues a qualitative warning. For instance, Kasznik and Lev (1995) studied all types of voluntary disclosure prior to a negative 4th quarter earnings surprise and compared the market reaction.

They concluded that warnings tend to become harder in the form of quantitative and earnings-related information as the earnings surprise increases. Unfortunately Kasznik and Lev (1995) grouped all earnings related warnings together when they compared the market reaction which included both qualitative and quantitative warnings. Moreover, they focused on all type of disclosures making it doubtful whether or not it holds for profit warning statements.

5.3.3 Univariate analysis –medium-term

Similar to the above analysis, this subsection starts with a univariate analysis which compares the mean BHAAR between firms issuing a qualitative warning and firms issuing a quantitative warning. Table 10 presents and compares the results.

Table 10: Univariate analysis – post-event window

Monthly returns are calculated using daily data and one month consists of 21 trading days. An independent sample t-test is used to test whether the mean difference is significant. The benchmark equals a single control firm (SCF) similar in size and market-to-book. QL represents the group of firms that issued a qualitative warning. QN represents the group of firms that issued a quantitative warning. To abstract the influence of extreme outliers results of the total sample are winsorized at the 2% level.

Month		N	BHAAR	T-stat	Mean diffeerence	Difference of means T-stat
3	1. QN	82	-6,20%	-2,44**	-2,51%	-0,57
	2. QL	35	-8,70%	-2,39**		
6	1. QN	82	-11,00%	-2,82***	-2,08%	-0,31
	2. QL	35	-13,08%	-2,80***		
9	1. QN	82	-13,98%	-3,52***	7,70%	0,99
	2. QL	33	-6,28%	-0,91		
12	1. QN	82	-17,43%	-4,26***	18,16%	2,36**
	2. QL	33	0,73%	0,10		

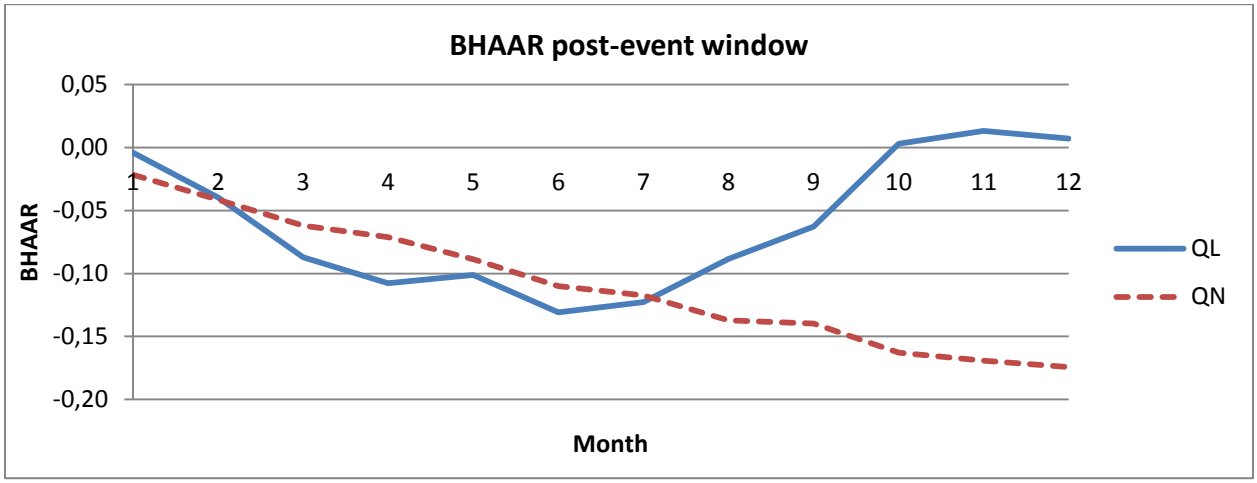
*** Statistically significant at the 1% level

** Statistically significant at the 5% level

* Statistically significant at the 10% level

Figure 4: Average Buy-and-hold abnormal return (BHAAR)

The benchmark consists of a single control firm similar in size and market-to-book. QL represents the group of firms that issued a qualitative warning. QN represents the group of firms that issued a quantitative warning.



The results of table 10 show that in the first three and six months after the warning the mean difference is more negative for qualitative warnings, which is consistent with my prediction. However the difference is insignificant in both windows. On the other hand the two remaining event windows show the complete opposite. Nine months after the warning the average BHAR is 7,7% less negative for qualitative warnings, although the result is insignificant. The result for a twelve month post-event window show that the difference has increased to 18,16%, which is significant at 5% level. In addition, figure 4 graphically displays how the market reaction develops for both type of warnings and clearly shows how this difference emerges. Overall the results do not support the notion that qualitative warnings induce a more negative market reaction in the event window. On the contrary as the length of the post-event window increases qualitative warning firms significantly outperform quantitative warning firms.

5.3.4 Multivariate regression analysis – medium term

Next, a multivariate regression analysis examines whether the above results are robust after including several control variables. The dependent variable consists of the 3, 6, 9 and 12 month post-event BHAR where the benchmark is equal to a single control firm (SCF). In the model a dummy variable is included that equals one if a firm issued a qualitative warning and zero if the firm issued a quantitative warning. The other independent variables include: firm size (LNTA), market-to-book ratio (MTB), high-tech industry membership (HTECH), basic earnings power (BEP), and leverage (LEV). Table 11 presents the results for this regression analysis.

Table 11 Multivariate regression analysis - post-event window

QL is a dummy variable that equals one for qualitative warnings and zero for quantitative warnings. LN MV is the natural log of total assets. MTB is the market-to-book ratio. HTECH is dummy variable that equals one for high-tech industry membership and zero otherwise. BEP represents the basis earnings power of a firm, which is the ratio between earnings before interest and taxes and total assets. LEV is the leverage of firm, which is the ratio of total liabilities and total assets. Data for independent variables are based upon the corresponding values reported at the end of the year prior to a profit warning. To abstract the influence of extreme outliers BHARs are winsorized at the 2% level.

		3-Months	6-Months	9-Months	12-Months
Intercept	Coefficient	-0,141	-0,070	-0,121	-0,032
	P-value	0,262	0,698	0,544	0,878
QL	Coefficient	-0,019	-0,009	0,092	0,197**
	P-value	0,674	0,895	0,219	0,013
MTB	Coefficient	0,005	-0,009	-0,017	-0,014
	P-value	0,506	0,357	0,120	0,249
HTECH	Coefficient	-0,035	-0,139	-0,125	-0,110
	P-value	0,547	0,103	0,179	0,261
LN MV	Coefficient	0,015	0,007	0,002	-0,013
	P-value	0,137	0,640	0,920	0,440
LEV	Coefficient	-0,209	-0,185	-0,084	0,019
	P-value	0,095*	0,307	0,670	0,926
BEP	Coefficient	0,062	0,440	0,992	0,836
	P-value	0,805	0,224	0,013**	0,046**
F-stat		0,83	1,44	2,39**	2,28**
adj R^2		-0,86%	2,22%	6,82%	6,31%
N		117	117	115	115

*** Statistically significant at the 1% level

** Statistically significant at the 5% level

* Statistically significant at the 10% level

As shown by table 11 the coefficient for QL is negative in a three and six month post-event period, which is consistent with the univariate analysis and my prediction, but the results are again insignificant. For the remaining nine and twelve month post-event window the sign of the QL coefficient changes from negative to positive consistent with the univariate analysis.

However only in a twelve month post-event period the coefficient for QL is significant (5%) and equal to 0,197. This means qualitative warning firms significantly outperform quantitative warning firms in this period by 19,7% controlling for several other factors.

Additional results show only a significant influence for leverage (LEV) and basic earnings power (BEP). The coefficient for LEV is -0,209 in a three month period, which is significant at the 10% level and consistent with my prediction. This indicates that firms with higher levels of leverage experience more negative BHARs, i.e. investors perceive these firms as riskier. The coefficient for BEP is 0,992 in a nine month period and 0,836 in a twelve month period and both values are significant at the 5% level. This is consistent with my predictions. It seems that in the medium term the consequences of a profit warning are less severe for firms with higher levels of basic earnings power.

Overall the results show that inconsistent with the expectation that the magnitude of the drift is more negative for qualitative warnings, instead it seems the drift is less negative. The negative sign of QL in the first six month is consistent with the findings of Bulkley and Herrerias (2005) in the US. But the difference is much smaller and insignificant compared to their study. On the other hand the positive influence of qualitative warnings in a longer event period is inconsistent with their findings. Given the similarity of the results in short and medium term it could be that the issue of a quantitative warning has a much bigger influence on the financial performance of a firm that the issue of a qualitative warning, i.e. it is perceived by the market as worse news. From a theoretical point of view the results are inconsistent with the behavioral model of Daniel et al.(1998) where the magnitude of the drift increases as the precision of a signal decreases (qualitative warning).

6. Conclusion, recommendations and limitations

This final section starts with the conclusions of this research. In section two recommendations for future research are given and the limitations of this study.

6.1 Conclusion

The objective of this research was to examine how the market reacts to a profit warning announcement in the Netherlands, in particularly whether there is evidence of post-event drift. In addition, this research examined whether the market reaction is more negative for qualitative warnings compared to quantitative warnings in the short and medium term. A qualitative warning is a statement that contains no new numerical revised forecast and is considered to be a less precise signal. A quantitative warning is a statement that contains a new numerical revised forecast and is considered to be a precise signal. The sample consists of 117 first-time profit warning issued by firms listed at Euronext Amsterdam between 2001 and 2007.

First of all consistent with the existing literature the results show that profit warnings are highly relevant information events that are followed by large negative abnormal returns in the short term. In an eleven-day announcement window the average CAR is -8,79%. The medium term results show that abnormal returns continue to drift downward following a profit warning announcement, a phenomenon that is usually attributed to market underreaction. The drift lasts for the entire twelve month post-event window with a BHAR that ranges from -6,05% for a market model to -12,22% for a single control firm similar in size and market-to-book.

Next a univariate analysis shows that the average CAR over the window (-5,5), (-5,1) and (1,5) are significantly smaller for qualitative warnings compared to quantitative warnings. However the difference is insignificant after including several control variables in a multivariate regression analysis except for the (-5,-1) window. For the medium term a univariate analysis shows again a positive influence of qualitative warnings during a one year post-event period. Moreover the findings are robust after including several control variables. In a one-year post-event window qualitative warning firms outperform quantitative warning firm by 19,7%.

Overall the results show that contrary to the semi-strong efficient market hypothesis abnormal returns continue to drift downward after a profit warning signal a phenomenon that is usually attributed to market underreaction. Furthermore contrary to the theoretical model of Daniel et al. (1998) and the findings of Bulkley and Herrerias (2005) the results provide no

evidence of a more negative market reaction for less precise qualitative warning in the medium term, on the contrary there seems to be an opposite relation.

6.2 Recommendations and limitations

There are several interesting extensions for future research. First of all studying other non-US markets should clarify whether or not the findings are sample specific or robust across various countries. Second of all, comparing the operating performance of firms that issue a qualitative and quantitative statement should provide additional insight regarding what type of warning is considered to be worse news. Thirdly, this research focuses on first-time profit warnings it is interesting to see whether the difference between qualitative and quantitative warnings is similar for repeated warnings. Fourthly, I define each warning that contains a numerical revised forecast either a point or range estimate as a quantitative warning. Given the smaller reaction for qualitative warnings one can examine whether the market reaction differs for several type of quantitative warnings.

As in every study this research is subjected to limitations that might have biased the results. First of all the small sample of qualitative warnings could have influenced the results although it is still higher than the proposed 30. Second of all, the data collection process could have disturbed the definition of a first-time profit warning in the beginning of the sample period. The base year of this research is 2001, but it could be that profit warnings that were defined as first-time warnings are biased towards the year 2000. I tried to adjust for this problem as much as possible given the content of the newspaper articles but it could be insufficient. Finally bad-model problems (Fama, 1998) indicate that any given pattern could just be the results of chance due to the chosen sample period.

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