Stock Returns Following Profit Warnings

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Abstract

We examine stock returns following unexpected corporate announcements that are described as profit warnings. Warnings fall into two classes: those that include a new earnings forecast, and those that offer only the guidance that earnings will be below current expectations. We find significant negative post-event abnormal returns in the first three months following both types of warning. We also find that abnormal returns are significantly more negative following qualitative warnings. This suggests that underreaction is more significant when news is imprecise. This in turn has implications for how underreaction might be explained.

Key words: Profit warnings; Market efficiency; Anomalies
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1. Introduction

Evidence that stock returns exhibit momentum (Jegadeesh and Titman, 1993) has attracted considerable attention. It is an anomaly that is proving robust (Rouwenhorst, 1998), and one that is particularly difficult to rationalize using conventional asset-pricing models. Jegadeesh and Titman (2001) reject the hypothesis of Conrad and Kaul (1998) that momentum is a consequence of cross-section differences in expected returns and Fama and French (1996) conclude that their three-factor model cannot explain momentum. This difficulty in explaining momentum as a failure to properly control for risk has led to the suggestion that momentum is observed because the market's reaction to news is drawn out over time, rather than immediate as expected in an efficient market. However no clear verdict on the underreaction hypothesis has emerged from the event study literature, in part because of reservations about the methodology that is employed in many studies.

A number of the concerns about event studies stem from the fact that results often rely on measures of abnormal returns over several years, and inference based on long-term abnormal performance is particularly controversial (Fama, 1998). A second area of concern for some observers is that events are often not just information but are also decisions that have direct consequences for cash flows and the risk characteristics of the firm (Ikenberry and Ramnath, 2002).

In this paper we test for abnormal performance following profit warnings. Profit warnings are an interesting event to investigate because they conform closely to the model of a noisy public signal about a specific and imminent realization, the quarterly earnings announcement. These characteristics mitigate the concerns about event studies expressed above. If there is an underreaction to warnings, and if abnormal returns are driven by the realization that corrects any initially biased reaction, then abnormal performance should be visible within two to three months. Approximately 90% of profit warnings precede the earnings announcement, to which they refer, by less than three months (see Table 3 below). Profit warnings are also a pure information event, and not a decision that has direct material consequences for the firm. Although there are other examples of pure information events, for example stock splits and exchange listings, they do not share the advantage that they are news about an imminent realization.

The advantage that warnings are an uncontaminated signal about a specific realization is reinforced by the sheer size of their initial impact on the market. Stock prices drop on average by approximately 22% in the announcement window for a profit warning, an initial impact that is much larger than that usually observed in event studies. For example it is a much larger fall than the average response to a large negative surprise in the scheduled quarterly earnings announcement. Bernard and Thomas (1989) report that the decile of stocks with the most disappointing earnings surprise delivered abnormal returns of approximately -2% in the announcement window.

Profit warnings divide into two rather different types of information event in a way that allows us to also investigate whether the quality of the information released has any bearing on the market's reaction. One class of warnings consists of those that include a prediction for the forthcoming earnings announcement, and we will refer to these as quantitative warnings. The other consists of those that offer only the qualitative guidance that earnings will be below current expectations. We will examine the announcement returns, and post-event returns, separately for each type of warning. These two different types of event offer the opportunity to test not only whether the market underreacts to news, but also whether the scale of any underreaction is related to the quality of the information released. This in turn has implications for how underreaction might be explained.

Profit warnings are an example of the discretionary disclosure of information by firms and therefore, as well as making a contribution to the general debate about underreaction, they are an event that is of particular interest in the context of the resurgence of interest in the question of how disclosures should be regulated (see, e.g., Milgrom, 1981; Grossman, 1981; Boot and Thakor, 2001; Admati and Pfleiderer, 2000). The two classes of warning allow us to test the well-known result in this literature (see, e.g., Milgrom, 1981) that a firm will only fail to fully disclose its information in the worst possible state, and the market will therefore interpret lack of full disclosure as particularly bad news. We test whether qualitative warnings are indeed worse news than warnings that include an earnings forecast, and whether the market interprets them as such. We discuss below whether there is any evidence that firms that issue qualitative warnings are simply less well informed.

The sample investigated in this study consists of announcements that were described by CNN as a profit warning. We find significant negative average abnormal returns on stocks purchased two

days after a profit warning, and held for the next three months. Post-event abnormal returns are significantly more negative following a qualitative warning, -9.6% over the three months, than following a quantitative warning, approximately -2% over the same horizon. We discuss in Section 4 how these figures compare with those reported in studies that find evidence of post-earnings-announcement drift.

The substantial difference between post-event abnormal returns for the two types of warnings is evidence that underreaction is exacerbated when news is imprecise. This points towards a model of underreaction where the precision of the new information is a determinant of the scale of underreaction, Daniel, Hirshleifer, and Subrahmanyam (1998). Underreaction to public news in that model is a consequence of an overconfidence in private information that leads to a bias in the perception and processing of news. Intuitively, it is easier for an overconfident investor to cling to prior beliefs in the face of a qualitative warning (or more precise signal) than when confronted with a new numerical forecast (or more precise signal).

Kasznik and Lev (1995) and Skinner (1994) investigate why firms choose to issue profit warnings before a bad earnings outcome. Skinner argues that managers may issue warnings to deter shareholder litigation and because they believe the market punishes managers who appear to delay bad news. Kasznik and Lev (1995) report that approximately half the firms that have a large negative earnings surprise issue a profit warning. They interviewed managers and report that one reason managers gave for not issuing profit warnings before bad earnings outcomes was that they believed that the market overreacts to profit warnings. The results reported here suggest that this fear is not well founded.

In Section 2 profit warnings are described in more detail and descriptive statistics for companies that issue warnings are presented. In Section 3 we describe the methodology used for aggregating daily returns into monthly abnormal returns and estimating statistical significance. In Section 4 results are presented for the whole sample and for sub-samples of warnings from firms that are matched to the smallest and largest size deciles and highest and lowest book-to-market quintiles. Section 5 concludes.

2. Profit Warnings

A profit warning is a description that analysts and journalists give to an unexpected corporate announcement that earnings for a specified future quarter will fall short of current expectations. The data set studied here consists of public statements by US companies that are described as profit warnings on the CNN site, www.cnn.com/markets/IRC/warnings.htlm between February 15th 1998 and December 31st 2000. CNN acquires its data from Briefing.com and the start of the data set used here is determined by the earliest date the data are available from Briefing.com.

This database includes the date of the warning, the earnings announcement that is the subject of the warning, the previous earning estimate and a revised forecast from the firm. The revised forecast may be quantitative, either a point estimate or a range, or may include only the qualitative statement that earnings or revenues will fall short of current expectations. Working with CNN data introduces an objective criterion for the inclusion of a firm in the data set, allowing replication and avoiding any sample selection issues. Examples of the data as reported by CNN are given in the Appendix.

It is common to observe repeated warnings from the same firm. Repeated warnings for the same quarterly earnings announcement may be issued, and some firms are observed issuing repeated warnings for consecutive quarterly announcements. One firm issued seventeen warnings in less than three years. Repeated warnings are excluded from the sample because overlapping multi-month returns mean that their inclusion would result in a double counting of returns from some firms and hence biased statistical inference. For the remainder of the paper all descriptive statistics and analysis will be for the sample in which repeated warnings are excluded. This sample consists of 429 qualitative warnings and 1,584 quantitative warnings.

The distribution across quarters can be seen in Fig. 1.

[Figure 1]

The distribution of warning firms across SIC industrial divisions is reported in Table 1. In view of the particular importance of the IT and Telecomm industries in the sample period, data for these

5

is reported separately from the remainder of the services and transportation divisions, of which they are normally a part.

[Table 1]

The distribution of warning stocks by size and book-to-market is reported in Table 2. The construction of the reference portfolios used in this table is described in detail in Section 3 below.

[Table 2]

It is clear from Table 2 that a disproportionately large fraction of profit warnings are from firms matched to low book-to-market portfolios. Given the empirical success of book-to-market in explaining cross-section stock returns this emphasizes the importance of controlling for book-to-market when measuring abnormal returns. The distribution of warning stocks across size portfolios does not display quite such a pronounced systematic pattern, but still a high percentage of warning firms are matched to the smaller size deciles.

A question raised in the introduction was whether companies that issue qualitative warnings have the same information as those that include quantitative earnings forecasts. The time between the warning and the actual earnings announcement should be one determinant of the precision of a firm's information about its quarterly announcement, at the date the warning is issued. If quantitative warnings were typically issued more frequently as the warning fell closer to the earnings announcement then this would be evidence for the hypothesis that they are chosen by better-informed companies. However there is no evidence of this in the small timing differences seen in Table 3 below, in which we report the distribution of the time between the warning and the scheduled earnings announcement to which it refers.

[Table 3]

3. Measuring Long-Term Abnormal Performance

A point estimate of long-term abnormal returns has to be calculated from daily returns data and the distribution of this estimator has also to be determined. A number of papers (see, e.g., Blume and Stambough, 1983; Roll, 1983; Kothari and Warner, 1997; Lyon, Barber, and Tsai, 1999) identify biases that can arise under the different methodologies that are employed to determine these two components of long-term abnormal performance. Lyon, Barber, and Tsai (1999) (LBT) show that these biases can be minimized by working with buy-and-hold abnormal returns, BHARs, calculated using carefully constructed reference portfolios. The point estimate of the BHAR is calculated from daily data as the buy-and-hold return on the event stock minus the buy-and-hold return on a reference portfolio that consists of firms whose characteristics match those of the event firm. LBT recommend evaluating statistical significance using either the bootstrap approach of Ikenberry, Lakonishok, and Vermaelen (1995) or the skewness-adjusted t-statistic. We will follow these recommendations in the results for post-event abnormal returns reported below.

LBT do not address the problem of biases induced by a bad model for expected returns and Fama (1998) notes that compounding, as for example with BHARs, will also compound model error. Therefore he recommends calculating cumulated abnormal returns, CARs, and so we report both BHARs and CARs.

The reference portfolios employed for calculating abnormal returns are fifty size/book-to-market portfolios and are constructed as follows. The reference portfolios are formed in two stages in July of each year t following a now widely used procedure (see, e.g., Fama and French, 1992). First, in June of each year, all NYSE firms are ranked on the basis of their size, measured by market value of equity. Size deciles are then created based on this ranking for all NYSE firms. NASDAQ and AMEX firms are placed in the appropriate NYSE size decile based on their June market value of equity. At the second stage, within each size decile, firms are divided into quintiles based on their book-to-market ratios in year t-1. A firm's book-to-market ratio in year t-1 is measured as the book value of common equity (COMPUSTAT data item 20) reported in the firm's balance sheet for year t-1 divided by the market value of common equity in December of year t-1.

A substantial decline in value up to and including the time of the warning is reported below. This implies that it is important to match firms based on their market value after the warning. Therefore when stocks are matched to reference portfolios this is done using their size measured two days after the warning, day $w+2$. Their book-to-market value is calculated using the t-1 value of book but divided by the market value of equity measured at the calendar day corresponding to $w+2$. A stock that issues a warning on a calendar day corresponding to day w is matched to the appropriate portfolio for the preceding July1st.

Returns data are taken from the Center for Research in Security Prices (CRSP) using the NYSE, AMEX, NASDAQ daily files. An important issue in the measurement of buy-and-hold returns is how to handle firms that issue warnings and are subsequently delisted. It is assumed, following LBT, that the investor places the proceeds from delisted firms, in the reference portfolio. Therefore whenever there is a missing daily return, it is replaced with the mean daily return of firms in the reference portfolio, and buy-and-hold returns are calculated from this then complete run of daily data. Similarly, when a member of a reference portfolio is missing returns data on any day, the missing return is replaced by the average daily return on the remaining stocks in the same portfolio.

Buy-and-hold returns on the reference portfolio for a particular horizon are calculated as follows. We first compound the buy-and-hold returns on each stock in the reference portfolio for that same horizon and then average across all stocks in the reference portfolio. If a firm i issues a profit warning its abnormal return is calculated as the buy-and-hold return on that stock minus the buy-and-hold return on the reference portfolio. That is $BHAR_{i,s,\tau}$, over horizon τ-s, starting on day s is calculated as

$$BHAR_{i,s,\tau} = \prod_{t=s}^{\tau}\left(1+R_{i,t}\right) - \frac{1}{n}\sum_{j=1}^{n}\left[\prod_{t=s}^{\tau}\left(1+R_{j,t}\right)\right] \tag{1}$$

where $R_{i,t}$ is the daily return on security i on day t. There are n securities, subscripted by j, in the reference portfolio to which firm i is matched. For each stock, s and τ are measured in event time,

that is relative to the warning, so for example if $s = w + 2$ for different stocks this is a different calendar day.

The average return on the m warning stocks over horizon τ-s, starting on day s, $BHAR_{s,\tau}$, is calculated as

$$BHAR_{s,\tau} = \frac{1}{m}\sum_{i=1}^{m}\left[BHAR_{i,s,\tau}\right] \tag{2}$$

For example if $s=w+1$ and $\tau=w+101$, $BHAR_{s,\tau}$, measures the average abnormal return on stocks bought one day after the warning and held for the next hundred days.

The cumulative abnormal return, $CAR_{s,\tau}$, on a portfolio of m warning stocks, each subscripted by i, and each held from day s until day τ is calculated as

$$CAR_{s,\tau} = \frac{1}{m}\sum_{i=1}^{m}\sum_{t=s}^{\tau}\left[R_{i,t} - RF_{t}\right] \tag{3}$$

where RF_{t} is the mean return on the securities in the reference portfolio for warning stock i on day t.

In addition to conventional t-tests, two additional methodologies for assessing statistical significance of long-term returns are applied. A parametric approach, motivated by the skewness of stock returns, is applied to both CARs and BHARs to calculate the skewness-adjusted t-statistic and then assess statistical significance using critical values from standard t- tables.

The skewness-adjusted t-statistic is calculated as

$$t_{sa} = \sqrt{n}\left(S + \frac{1}{3}\hat{\gamma}S^2 + \frac{1}{6n}\hat{\gamma} \right)$$

(4)

where

$$S = \frac{\overline{BHAR}_{\tau}}{\sigma\left(BHAR_{\tau}\right)}, \text{ and } \hat{\gamma} = \frac{\sum_{i=1}^{n}\left(BHAR_{i\tau} - \overline{BHAR}_{\tau}\right)^3}{n\,\sigma^3\left(BHAR_{\tau}\right)}$$

A non-parametric approach, recommended by LBT, is to assess statistical significance of BHARs using pseudoportfolios to generate the empirical distribution of long-term abnormal returns under the null hypothesis. For each firm that issues a profit warning in our sample a firm is randomly selected, with replacement, from the matched reference portfolio. Its abnormal return, relative to the reference portfolio from which it was drawn, is computed over exactly the same calendar horizon as for the warning firm. Average abnormal returns for this matched sample are then computed, just as was done for the original sample. This procedure is then repeated 1000 times and thereby the empirical distribution of mean long-term abnormal returns under the null is approximated. The probability p of obtaining a particular value for abnormal returns, under the null, is obtained from this empirical distribution.

The null hypothesis tested is that the mean long-term return on warning firms, $\overline{BHAR}_{\tau}$, over a particular horizon, equals the mean long-term return on randomly drawn firms from the matched reference portfolios, over the same horizon.

This hypothesis is rejected at the α significance level if

$BHAR_\tau \leq y_l^*$ or $BHAR_\tau \geq y_u^*$. These two values of y^* are found by solving

$$\Pr\left[BHAR_p \leq y_l^*\right] = \Pr\left[BHAR_p \geq y_u^*\right] = \frac{\alpha}{2}$$

where $BHAR_p$ is the mean abnormal returns on the pseudoportfolios, $p = 1….1000$. This is a computer intensive technique and is only applied to BHARs at the three and six month horizons.

4. Abnormal Returns Following Profit Warnings

In this Section abnormal returns in a window around the announcement of a profit warning, and for different horizons in the following six months, are reported. In the next sub-section abnormal returns in the announcement window are reported.

4.1. Abnormal returns in an eleven-day announcement window

The first period to be examined in detail is from five days before the warning to five days after it. In the announcement window simple daily abnormal returns are reported and cumulated. Abnormal returns are calculated for each warning stock, relative to its reference portfolio, and the averages of these daily returns across all warning stocks are reported in Table 4.

 [Table 4]

The importance of profit warnings is seen in the cumulative fall in price of approximately 22% in this announcement window. Returns are more negative for qualitative warnings, -24.7%, than for quantitative warnings, -20.7%. We can test whether this difference is statistically significant using the *t*-test of the null that two samples are drawn from the same population. This yielded a *t*-statistic of 2.49, significant at the 1% level. We infer that profit warnings that are not accompanied by earnings forecasts are interpreted as worse news on average than those that

include specific earnings guidance. This confirms the prediction, reviewed in the introduction, that lack of disclosure will be interpreted as particularly bad news (Milgrom, 1981). Whether it is fully recognized just how bad news a qualitative warning is will be evident in the next sub-section.

A notable feature of these results is the size of the negative returns on the day following the warning. However this probably does not reflect a profit opportunity of short selling stocks on the day of the warning, but is due to some warnings being issued after markets closed. This inference is supported by the fact that almost 25% of the sample actually delivered positive returns on the day CNN reported that the warning was issued, and 50% of warning stocks delivered abnormal returns of more than -4% on that day.

4.2. Abnormal returns following a profit warning: the next six months

In this sub-section abnormal returns are reported for stocks purchased two days after a profit warning and held for the next six months. In preliminary work we traced abnormal returns for twelve months following the warnings, but there was no evidence of significant abnormal returns in the six to twelve months after the warning and therefore we confine results reported here to the first six months.

[Table 5]

4.2.1. Qualitative profit warnings

Table 5 shows that purchasing stocks two days after qualitative warnings are announced delivers negative abnormal returns, measured both by CARs and BHARs, for all horizons of between two and six months. For example the BHAR is approximately -9.6% after three months and -11.8% after six months. In the case of CARs, the results are significant for each successive month, after the first month, at the 1% level. For BHARs, after the first month, results are also significant at the 1% level, except for month five. The skewness-adjusted *t*-statistic does generally reduce the statistical significance of the results, but the difference is rather marginal for most horizons. Using the non-parametric pseudoportfolio approach to compute an empirical *p* value, not a single one of the thousand pseudoportfolios delivered over six months a BHAR as low as the -11.8% recorded for this

12

sample of warning stocks.

It is hard to see the BHAR of approximately -9.6% in the first three months following a qualitative warning, an annualized abnormal return of -38.4%, as anything other than evidence of underreaction to qualitative warnings. Most of the abnormal returns following qualitative warnings accrue in the first three months, and this suggests that an important driver of abnormal returns is the earnings announcement. Table 3 shows that approximately 92% of earnings announcements have been made within three months of qualitative warnings.

4.2.2. Quantitative profit warnings
Table 5 shows that purchasing stocks two days after quantitative warnings delivers a BHAR of -2% and a CAR of -2.2% over three months, both significant at the 5% level under all test statistics reported. There is no evidence of significant abnormal returns beyond three months.

It is interesting to compare these figures to the scale of the widely documented post-earnings-announcement drift. In order to make this comparison first note that when we report abnormal returns they are measured relative to expected returns. However abnormal returns in these studies are usually reported as the difference between the returns on the decile portfolio with the highest unexpected earnings and the returns on the portfolio with the lowest unexpected earnings. For example Bernard and Thomas (1989) report abnormal returns of 6.3% over 60 days, using this definition. This is the sum of the outperformance, relative to normal returns, of one portfolio and the underperformance, relative to normal returns, of the other. If outperformance and underperformance were symmetrical this would imply abnormal returns, as we measure them, of approximately -3.2% over 60 days on the decile with the most disappointing earnings outcomes, a similar figure to our results for quantitative warnings.

This evidence suggests that the phenomenon of post-earnings-announcement drift extends to unexpected earnings news. Furthermore the estimates of the scale of the drift are rather similar despite the fact quantitative warnings are unexpected, have a much larger initial impact, and are a noisy forecast of a scheduled announcement. However there is no evidence of additional factors driving abnormal returns following quantitative warnings, over and above those following scheduled

earnings announcements. In particular there is no evidence that the earnings announcement brings further bad news, and therefore we cannot easily explain the underreaction to quantitative warnings as a consequence of investors' failure to rationally update their forecast of quarterly earnings following the warning.

The substantial difference in post-event abnormal returns between warnings that simply state that earnings will be below current expectations and those that include a specific forecast has implications for what models might explain underreaction. We explore this difference, and its implications, in the next sub-section.

4.2.3. Contrasting the reaction to quantitative and qualitative profit warnings

We first test whether the difference between the point estimates of abnormal returns following the two classes of warning is statistically significant using the *t*-test of the null that two samples are drawn from the same population. A test applied to the BHAR after three months yields a *t*-statistic of 4.41, and for the BHAR after six months the *t*-statistic is 3.04, both significant at the 1% level. For the CAR the *t*-statistics are 3.70 at three months and 2.55 at six months, both significant at the 1% level. We infer that abnormal returns are significantly more negative following qualitative warnings.

More negative abnormal returns following qualitative warnings imply that underreaction is more significant when news is simply negative rather than when there is also a quantitative forecast of how bad it is likely to be. If qualitative warnings are interpreted as less precise information then this result is consistent with a model where underreaction to public news is a consequence of overconfidence (Daniel et al., 1998). In that model the precision of the public information plays an explicit role in determining the size of the bias in investor's reaction to that news (see equation B16 in Appendix B of Daniel et al., 1998). Comparing quantitative warningsIntuitively, there is much more opportunity for an overconfident investor to downplay the news if it is qualitative (or less precise) than if it is accompanied by a quantitative forecast.

We have already reported in sub-section 4.1 that a qualitative warning is initially perceived as worse news than a quantitative warning, although the market still underestimates how much worse news it is. We next examine the other half of the prediction about disclosure, which is that a qualitative warning *is* particularly bad news. A measure of how bad news a warning is can be obtained by cumulating returns from five days before the warning is issued to three months later, by which time approximately 90% of earnings announcements will be public. Cumulative abnormal returns are -32.2% for qualitative warnings but only -22.7% for quantitative warnings. This suggests that qualitative warnings are chosen when the earnings outcome represents a bigger disappointment, relative to expectations five days before any warning is issued.

4.3. Does a firm's size, or whether it is a glamour or value stock, affect announcement and post-event abnormal returns?

In this sub-section we investigate whether post-event abnormal returns are systematically different for small and large firms, and for value and growth stocks. We also investigate whether the result for the full sample that qualitative warnings are followed by more negative abnormal returns than quantitative warnings is robust. We first report abnormal returns in the announcement window in Table 6.

[Table 6]

Table 6 shows that the initial impact of profit warnings is very much greater for small firms than large. We also see that for small firms, qualitative warnings have a much larger initial impact than quantitative warnings. Table 6 shows that growth stocks are hit harder by profit warnings than value stocks, and this is particularly true for qualitative warnings.

[Table 7]

Table 7 shows that post-event abnormal returns are always more negative for small firms than for the full sample. This is consistent with other studies that find post-event abnormal returns are more

15

significant for small firms than for large firms (see e.g., Chan, 2003; Loughran and Ritter, 2000; Brav, Geczy, and Gompers, 2000). In particular it complements the results of Bernard and Thomas (1989) who find that abnormal returns following earnings announcements were more significant for smaller firms. On the other hand, whether a firm is a value or a growth stock does not appear to make a substantial systematic difference to subsequent abnormal returns.

Table 7 shows post-event abnormal returns are less negative for the largest firms than for the full sample. Nevertheless for qualitative warnings they are still a statistically significant -8% over three months. However there is no evidence in post-event abnormal returns of underreaction to quantitative warnings from the largest decile of firms.

Table 7 also shows that the result for the full sample that qualitative warnings are followed by more negative post-event abnormal returns than quantitative warnings is robust. It is true for the largest and smallest deciles and value and growth quintiles.

Tables 6 and 7 show that qualitative warnings are really very bad news for small firms, and much worse news than quantitative warnings from small firms. Despite a CAR of -30.1% in the announcement window, the BHAR is a further -34.5% in the next six months following a qualitative warning. A small firm that issues a quantitative warning loses 24% in the announcement window and only a further 7.6% in the next six months. This confirms the judgment for the full sample that qualitative warnings appear to be chosen when the earnings surprise, relative to expectations 5 days before the warning, is relatively large.

4.4. Abnormal returns in the twelve months prior to a profit warning

Abnormal returns reported in this sub-section are for a sample constructed with the hindsight that a warning was eventually issued and therefore no inferences can be made about the performance of markets prior to the warning. Any abnormal returns found cannot be interpreted as a profitable trading opportunity. Nevertheless it is of interest to see the performance of firms that issue profit warnings in a long-term context. For example, do profit warnings come as a complete surprise or do they follow a string of negative public and/or private signals, and if so for how long on average has the market been receiving negative news about these firms? Abnormal returns prior to warnings will

contribute some evidence on these questions.

In Table 8 abnormal returns are reported for the sample of warning stocks commencing 260 trading days, or twelve months, before the warning. Table 8 shows that the market starts to get signals of a problem approximately six months before a profit warning is issued. In the three months preceding the warning announcement window, stocks loose approximately 25% of their value. Clearly the market has been receiving signals of problems at these firms for some time before the warning was issued.

 [Table 8]

5. Discussion and summary

A puzzling feature of stock returns is the robust result that momentum trading appears to be profitable. It is not easy to explain this result as a failure to properly control for risk, but it has been suggested that it can be explained by a systematic underreaction of markets to new information. However the underreaction hypothesis is itself contentious. Profit warnings have several characteristics that suggest that testing for post-event abnormal performance will contribute useful new evidence on the reaction of markets to public news. Profit warnings are a pure information event, have a very large initial impact, and are a signal about a specific and imminent earnings realization. If the initial reaction is biased, then these characteristics imply that the correction should be relatively large and quick. This should yield results that are less sensitive to the problems that plague the measurement of long-term abnormal returns, including that of specifying a model of normal returns.

In the case of qualitative warnings these advantages do indeed lead to a decisive verdict on the underreaction hypothesis. Negative abnormal returns of -9.6% are reported in the first three months following qualitative profit warnings. It seems unlikely that stocks that have just issued qualitative profit warnings could be so much less risky than the reference portfolio of firms, matched by size and book-to-market, that a bad model for normal returns could explain an annualized abnormal return of -38%. Abnormal returns following quantitative warnings are of smaller absolute size, but

17

still a statistically significant -2.2% over three months. This evidence of underreaction is consistent with the observation that firms often need to issue repeated warning for the same quarterly earnings announcement.

The difference between abnormal returns following the two classes of warning implies that underreaction is more significant in response to announcements that are simply bad news, without precise figures being specified. This is revealing about potential explanations for underreaction. If qualitative warnings are viewed as less precise information than quantitative warnings then it points towards a particular behavioral model proposed by Daniel et al. (1998) that assumes investors exhibit an overconfidence bias. In this model the precision of the public signal is an explicit determinant of the underreaction.

Evidence is reported that qualitative warnings are chosen when the earnings outcome is relatively bad, relative to expectations five days before the warning is issued. This leads to the question of whether the decision not to include a quantitative forecast in the profit warning reflects deliberate strategic management of news-flow. If it does, what is the motivation for such news management? For example if the aim is to allow the bad news to emerge gradually over time, then the negative post-event abnormal returns indicate that the policy is successful. However articulating a motivation for such a policy is not easy. Clearly a useful start would be an investigation of whether the choice of quantitative or qualitative warnings can be explained empirically.

In summary, our results for both classes of warning lend empirical support to the conjecture that momentum can be explained by the underreaction of the market to new information. In addition, comparing abnormal returns following quantitative and qualitative warnings, the evidence reported here suggests that some examples of underreaction can be explained by behavioral models that assume overconfident investors who exhibit biases in the perception and processing of new information. Our results imply that underreaction is likely to be more significant in the case of announcements that are simply bad news, without any specific forecast to anchor expectations.

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Appendix

Examples of the data as reported on the CNN website are:

1) Quantitative estimates, in which case the firm makes a forecast that specifies a new

   earnings estimate, for example:

Date	Firm	Ticker	Period	End of	Prior Estimate	Revised Forecast
25-Jan-00	Sportsman's Guide	SGDE	Q4	199912	$0.30	$0.13
04-Jan-99	Arch Coal	ACI	Q4	199812	$0.09	Breakeven
31-Jan-00	IPC Holdings	IPCR	Q4	199912	$0.52	Loss of $0.84
21-Sep-98	Silicon Gaming, Inc.	SGIC	Q3	199809	-$0.27	Loss of $0.34 to $0.38
29-Jun-98	Olsten Corp	OLS	Q2	199806	$0.20	About $0.11
20-Jan-99	BellSouth	BLS	Q1	199812	$0.41	Reduced by about $0.09

2) Qualitative estimates, in which case the firm simply states or implies that current

   expectations are too high without giving explicit guidance on a new figure, for example:

Date	Firm	Ticker	Period	End of	Prior Estimate	Revised Forecast
13-Mar-98	Alteon	ALT	Q1	199803	$0.45	Unlikely to reach estimates
21-May-99	Amcast Industrial	AIZ	Q3	199905	$0.65	Significantly below estimate
04-Jan-01	Watchguard Tech	WGRD	Q4	200012	$0.03	Revs below estimate
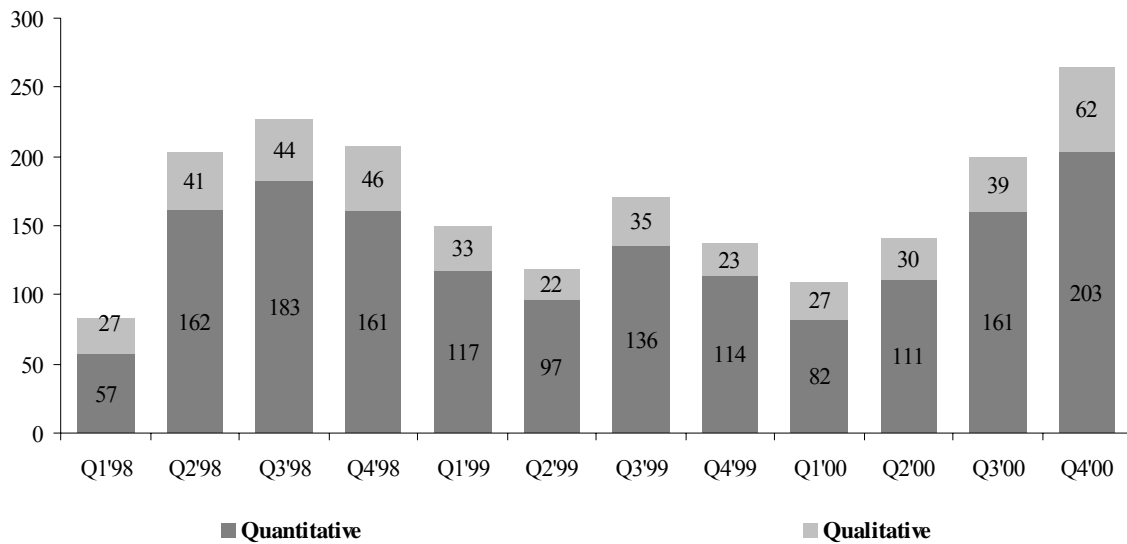
Fig.1.Number of qualitative and quantitative profit warnings, by quarter, February 15th 1998-December 31st 2000. Quantitative warnings are defined as those that include a forecast for the scheduled earnings announcement to which they refer. Qualitative warnings are defined to be those that only offer the guidance that earnings will be below current expectations.

Table 1

The distribution of warning firms across industrial sectors.

Percentage of firms that issue profit warnings, February 15th 1998-December 31st 2000, that belong to each 2-digit SIC division. IT and Telecom are reported separately from the rest of the Services and Transport division. This sample consists of 2013 firms and 429 warnings were qualitative and 1584 were quantitative. Quantitative warnings are defined as those that include a forecast for the scheduled earnings announcement to which they refer. Qualitative warnings are defined to be those that only offer the guidance that earnings will be below current expectations.

Industry sector	Quantitative Warnings	Qualitative Warnings
Agriculture	0.13%	0.00%
Construction	0.82%	1.17%
Finance Insurance And Real Estate	8.08%	4.66%
Manufacturing	45.08%	48.95%
Mining	1.07%	1.17%
Retail Trade	8.02%	5.36%
Services	10.98%	10.96%
Transport. Electric Gas & Sanitary Services	6.00%	6.76%
Wholesale Trade	4.92%	3.73%
IT and Telecom	14.90%	17.25%
	100.00%	100.00%

Table 2

Distribution of warning stocks across reference portfolios.

Each cell reports the percentage of warning stocks, in the sample February 15th 1998-December 31st 2000, that belong to each of the 50 size and book-to-market sorted reference portfolios used to calculate abnormal returns. The reference portfolios are constructed as described in Section 3. This sample consists of 2013 firms and 429 warnings were qualitative and 1584 were quantitative. Quantitative warnings are defined as those that include a forecast for the scheduled earnings announcement to which they refer. Qualitative warnings are defined to be those that only offer the guidance that earnings will be below current expectations.

Size Decile	Lowest BM	2	BM Quintile 3	4	Highest BM	TOTAL
Panel A: Qualitative Warnings						
SMALL	9.79%	4.43%	3.03%	0.00%	0.00%	**17.3 %**
2	5.83%	4.43%	0.93%	1.17%	0.00%	**12.4 %**
3	4.90%	3.73%	4.90%	2.80%	0.47%	**16.8 %**
4	4.66%	2.10%	2.33%	2.33%	0.23%	**11.7 %**
5	2.56%	1.17%	1.17%	0.47%	0.70%	**6.1 %**
6	1.86%	0.70%	1.86%	1.40%	0.00%	**5.8 %**
7	2.33%	1.63%	0.70%	1.40%	0.70%	**6.8 %**
8	1.17%	0.93%	0.23%	1.40%	0.70%	**4.4 %**
9	2.56%	0.70%	0.47%	1.63%	5.36%	**10.7 %**
LARGE	1.86%	1.17%	1.63%	1.63%	1.86%	**8.2 %**
TOTAL	**37.5%**	**21.0%**	**17.3%**	**14.2%**	**10.0%**	**100 %**
Panel B: Quantitative Warnings						
SMALL	5.68%	3.47%	1.39%	0.13%	0.06%	**10.7 %**
2	4.73%	4.48%	2.71%	1.14%	0.13%	**13.2 %**
3	4.80%	3.22%	3.72%	2.84%	0.44%	**15.0%**
4	3.72%	2.40%	1.89%	2.59%	0.25%	**10.9%**
5	3.41%	2.08%	1.96%	1.33%	1.20%	**10.0 %**
6	2.71%	1.77%	1.14%	1.89%	0.95%	**8.5 %**
7	2.15%	1.14%	1.26%	1.77%	0.57%	**6.9 %**
8	1.77%	1.20%	2.02%	0.95%	0.51%	**6.4 %**
9	1.70%	1.77%	1.64%	1.20%	3.28%	**9.6 %**
LARGE	1.64%	1.83%	1.58%	2.15%	1.64%	**8.8 %**
TOTAL	**32.3%**	**23.4%**	**19.3%**	**16.0%**	**9.0%**	**100%**

Table 3

Elapsed time from profit warning to earnings announcement.

Each cell reports the percentage of profit warnings that lead the scheduled earnings announcement by different times, in the sample of warnings issued February 15th 1998-December 31st 2000. A month is measured as 21 trading days. Quantitative warnings are defined as those that include a forecast for the scheduled earnings announcement to which they refer. Qualitative warnings are defined to be those that only offer the guidance that earnings will be below current expectations. This sample consists of 2013 stocks: 429 warnings were qualitative and 1584 were qualitative.

Time between the warning and the announcement	Quantitative Warnings	Qualitative Warnings
Less than 1 Month	44.06%	45.44%
1 to 2 Months	30.46%	39.60%
2 to 3 Months	10.79%	7.30%
3 to 4 Months	6.54%	3.28%
4 to 5 Months	0.84%	1.46%
More than 5 Months	7.31%	2.92%
	100.00%	100.00%

Table 4

Abnormal returns in the announcement window.

Daily abnormal returns for an individual stock are calculated as the daily return on the stock minus the daily return on the reference portfolio to which it is matched, by size and book-to-market, for the sample of firms that issued warnings, February 15th 1998-December 31st 2000. This sample consists of 2013 firms: 429 warnings were qualitative and 1584 were quantitative. AR measures the daily average abnormal returns for an equally-weighted portfolio of warning stocks. Days are measured relative to the day of the warning. CAR records the cumulated value of AR up to each day, starting from day -5. Quantitative warnings are defined as those that include a forecast for the scheduled earnings announcement to which they refer. Qualitative warnings are defined to be those that only offer the guidance that earnings will be below current expectations. The significance of t-statistics for AR at levels of 10%, 5% and 1% are denoted by *, **, and ***, respectively. CARs are significant at the 1% level for all days later than -5.

Day		All		Qualitative Warnings		Quantitative Warnings	
		AR	CAR	AR	CAR	AR	CAR
-5	Mean	-0.61%	-0.61%	-0.72%	-0.72%	-0.58%	-0.58%
	St. Dev	4.90%	4.90%	6.59%	6.59%	4.33%	4.33%
	t-stat	-5.61 ***	-5.61	-2.27 **	-2.27	-5.36 ***	-5.36
-4	Mean	-0.65%	-1.26%	-0.74%	-1.47%	-0.63%	-1.21%
	St. Dev	4.84%	6.92%	6.07%	8.78%	4.44%	5.98%
	t-stat	-6.03 ***	-8.17	-2.53 ***	-3.47	-5.60 ***	-8.05
-3	Mean	-0.81%	-2.07%	-1.23%	-2.69%	-0.69%	-1.90%
	St. Dev	4.75%	8.53%	5.36%	10.49%	4.56%	7.45%
	t-stat	-7.62 ***	-10.90	-4.73 ***	-5.31	-6.04 ***	-10.15
-2	Mean	-0.98%	-3.05%	-1.11%	-3.80%	-0.95%	-2.85%
	St. Dev	5.22%	10.06%	6.38%	-12.21%	4.86%	8.79%
	t-stat	-8.42 ***	-13.61	-3.59 ***	-6.45	-7.74 ***	-12.90
-1	Mean	-1.23%	-4.28%	-1.30%	-5.10%	-1.21%	-4.06%
	St. Dev	6.64%	12.05%	8.26%	14.37%	6.13%	10.66%
	t-stat	-8.32 ***	-15.95	-3.26 ***	-7.35	-7.86 ***	-15.16
0	Mean	-8.50%	-12.78%	-10.03%	-15.13%	-8.08%	-12.14%
	St. Dev	14.27%	18.36%	15.90%	21.63%	13.77%	17.37%
	t-stat	-26.72 ***	-31.25	-13.05 ***	-14.49	-23.36 ***	-27.82
1	Mean	-8.53%	-21.31%	-8.80%	-23.93%	-8.46%	-20.60%
	St. Dev	15.38%	24.92%	16.83%	27.89%	14.97%	22.99%
	t-stat	-24.87 ***	-38.40	-10.82 ***	-17.77	-22.47 ***	-35.66
2	Mean	0.12%	-21.19%	0.22%	-23.70%	0.09%	-20.51%
	St. Dev	6.71%	25.56%	7.73%	28.47%	6.41%	23.75%
	t-stat	0.78	-37.22	0.60	-17.24	0.54	-34.37
3	Mean	-0.07%	-21.26%	-0.01%	-23.72%	-0.09%	-20.60%
	St. Dev	6.09%	25.89%	6.85%	29.39%	5.87%	24.51%
	t-stat	-0.52	-36.87	-0.03	-16.72	-0.59	-33.45
4	Mean	-0.07%	-21.34%	-0.54%	-24.26%	0.05%	-20.54%
	St. Dev	5.43%	26.36%	5.88%	29.88%	5.30%	25.02%

	t-stat	-0.6112	-36.35	-1.91 *	-16.82	0.40	-32.67
5	**Mean**	**-0.39%**	**-21.72%**	**-0.61%**	**-24.87%**	**-0.33%**	**-20.87%**
	St. Dev	5.22%	26.87%	5.83%	30.43%	5.04%	25.61%
	t-stat	-3.33 ***	-36.29	-2.17 **	-16.93	-2.58 ***	-32.43

Table 5

Buy-and-hold and cumulated abnormal returns from 2 days after a warning up to six months after the warning, for the sample of stocks that issued profit warnings February 15th 1998-December 31st 2000.

This sample consists of 2013 firms: 429 warnings were qualitative and 1584 were quantitative. The BHAR for an individual stock is calculated as the buy-and-hold return on the stock minus the average buy-and-hold return on the reference portfolio to which it is matched by size and book-to-market, as described in equation (1). BHAR measures average buy-and-hold abnormal returns on the sample of stocks that have issued profit warnings, measured from two days after the warning, up to successive months following the warning. A month is measured as 21 trading days. The CAR for an individual stock is calculated as the cumulated daily abnormal return. The daily abnormal return is calculated as the daily return on the stock minus the average daily return on the reference portfolio to which it is matched by size and book-to-market. Monthly CARs reported below are the average of individual stock CARs up to successive months following the warning. Quantitative warnings are defined as those that include a forecast for the scheduled earnings announcement to which they refer. Qualitative warnings are defined to be those that only offer the guidance that earnings will be below current expectations. Conventional *t*-statistics are shown, as well as the skewness-adjusted *t*-statistic, denoted s-a *t*-stat, calculated as described in equation (4). The *p*-value represents the probability of a realization more negative than that observed, under the null of no abnormal performance, using bootstrapped pseudoportfolios as described in Section 3. The significance levels of 10%, 5% and 1% are denoted by *, **, and ***, respectively.

Month		CAR		BHAR	
		Qualitative Warnings	**Quantitative Warnings**	**Qualitative Warnings**	**Quantitative Warnings**
M1	**Mean**	**-1.36%**	**0.38%**	**-1.26%**	**0.47%**
	St. Dev	26.67%	18.99%	27.43%	19.59%
	t-stat	-1.05	0.80	-0.94	0.95
	s-a *t*-stat	-1.02	0.80	-0.89	0.97
M2	**Mean**	**-6.61%**	**0.13%**	**-7.13%**	**0.33%**
	St. Dev	33.31%	26.08%	28.82%	26.35%
	t-stat	-4.10 ***	0.19	-5.12 ***	0.50
	s-a *t*-stat	-4.32 ***	0.19	-4.94 ***	0.50
M3	**Mean**	**-8.51%**	**-2.19%**	**-9.59%**	**-1.98%**
	St. Dev	42.56%	33.16%	36.66%	33.80%
	t-stat	-4.14 ***	-2.63 ***	-5.42 ***	-2.32 ***
	s-a *t*-stat	-4.27 ***	-2.63 ***	-4.71 ***	-2.25 **
	p-values			0.01	0.05
M4	**Mean**	**-7.55%**	**-1.32%**	**-8.95%**	**-1.23%**
	St. Dev	48.71%	38.38%	45.91%	42.51%
	t-stat	-3.20 ***	-1.36	-4.03 ***	-1.15
	s-a *t*-stat	-3.30 ***	-1.35	-3.53 ***	-1.12

M5	**Mean**	**-7.48%**	**-1.95%**	**-7.69%**	**-1.96%**
	St. Dev	53.33%	43.35%	71.81%	51.15%
	t-stat	-2.90 ***	-1.78 *	-2.21 **	-1.52
	s-a *t*-stat	-2.89 ***	-1.78 *	-1.67	-1.43
M6	**Mean**	**-9.35%**	**-1.94%**	**-11.78%**	**-1.66%**
	St. Dev	56.69%	48.54%	60.36%	54.89%
	t-stat	-3.41 ***	-1.59	-4.04 ***	-1.20
	s-a *t*-stat	-3.45 ***	-1.59	-3.20 ***	-1.16
	p-values			0.00	0.11

Table 6

Abnormal returns in the announcement window for extreme size deciles and book-to-market quintiles.

In panel A abnormal returns are reported for the smallest decile and largest decile of stocks in the sample of firms that issued warnings, February 15th 1998-December 31st 2000. The decile of smallest stocks that issued qualitative warnings consists of 74 firms. The decile of largest stocks that issued qualitative warnings consists of 35 firms. The decile of smallest stocks that issued quantitative warnings consists of 170 firms. The decile of largest stocks that issued quantitative warnings consists of 140 firms. In panel B abnormal returns are reported for the quintiles of stocks with the lowest and highest book-to-market in the sample of firms that issued warnings, February 15th 1998-December 31st 2000. The quintile portfolio with the lowest book-to-market of firms that issued qualitative warnings consisted of 161 firms. The quintile portfolio with the highest book-to-market of firms that issued qualitative warnings consisted of 43 firms. The quintile portfolio with the lowest book-to-market of firms that issued quantitative warnings consisted of 512 firms. The quintile portfolio with the highest book-to-market of firms that issued quantitative warnings consisted of 143 firms. Daily abnormal returns for an individual stock are calculated as the daily return on the stock minus the daily return on the reference portfolio to which it is matched by size and book-to-market. AR measures the daily average abnormal returns for the equally-weighted decile/quintile portfolio of warning stocks. CAR records the cumulated value of AR up to each day. Quantitative warnings are defined as those that include a forecast for the scheduled earnings announcement to which they refer. Qualitative warnings are defined to be those that only offer the guidance that earnings will be below current expectations. Days are measured relative to the day of the warning. For AR the significance of *t*-statistics at levels of 10%, 5% and 1% are denoted by *, **, and ***, respectively.
.

Panel A: Extreme Size Deciles

| | Qualitative Warnings | | | | Quantitative Warnings | | | |
| | Smallest | | Largest | | Smallest | | Largest | |
Day	AR	CAR	AR	CAR	AR	CAR	AR	CAR
-5 Mean	**-1.22%**	**-1.22%**	**-0.55%**	**-0.55%**	**-1.07%**	**-1.07%**	**-0.36%**	**-0.36%**
St. Dev	6.33%	6.33%	3.18%	3.18%	5.03%	5.03%	3.27%	3.27%
t-stat	-1.67 *	-1.67	-1.03	-1.03	-2.80 ***	-2.80	-1.35	-1.35
-4 Mean	**-0.45%**	**-1.66%**	**0.03%**	**-0.52%**	**-0.06%**	**-1.12%**	**-0.46%**	**-0.82%**
St. Dev	9.29%	10.45%	3.04%	4.25%	5.09%	7.06%	2.72%	4.12%
t-stat	-0.41	-1.40	0.06	-0.70	-0.15	-2.06	-2.00 **	-2.21
-3 Mean	**-1.79%**	**-3.45%**	**0.67%**	**0.16%**	**-1.44%**	**-2.56%**	**-0.47%**	**-1.29%**
St. Dev	6.21%	12.64%	3.55%	5.49%	4.81%	8.37%	2.67%	4.79%
t-stat	-2.47 ***	-2.38	1.14	0.22	-3.91 ***	-4.10	-2.14 **	-3.09
-2 Mean	**-1.13%**	**-4.58%**	**-0.18%**	**0.02%**	**-1.99%**	**-3.55%**	**-0.57%**	**-1.86%**
St. Dev	9.93%	16.12%	3.21%	6.38%	5.90%	9.82%	2.98%	5.46%
t-stat	-0.98	-2.45	-0.32	0.08	-2.17 **	-4.70	-2.32 **	-3.97
-1 Mean	**-1.85%**	**-6.43%**	**-0.23%**	**-0.25%**	**-1.10%**	**-4.65%**	**-0.82%**	**-2.68%**
St. Dev	7.65%	18.13%	2.48%	6.72%	7.15%	12.11%	3.02%	6.42%
t-stat	-2.09 **	-3.04	-0.57	-0.26	-2.00 **	-5.01	-3.26 ***	-4.80

0 Mean	**-9.34%**	**-15.78%**	**-7.33%**	**-7.59%**	**-8.85%**	**-13.50%**	**-5.46%**	**-8.14%**
St. Dev	15.87%	24.17%	9.98%	11.87%	15.00%	19.23%	9.16%	11.23%
t-stat	-5.09 ***	-5.62	-4.38 ***	-3.79	-7.70 ***	-9.26	-7.08 ***	-8.22
1 Mean	**-10.23%**	**-26.01%**	**-2.61%**	**-10.20%**	**-9.96%**	**-23.46%**	**-3.10%**	**-11.25%**
St. Dev	19.72%	31.47%	10.14%	15.55%	16.17%	25.08%	8.36%	14.16%
t-stat	-4.46 ***	-7.11	-1.52	-3.88	-8.05 ***	-12.36	-4.42 ***	-9.02
2 Mean	**-0.76%**	**-26.76%**	**-0.65%**	**-10.85%**	**-0.85%**	**-24.32%**	**0.05%**	**-11.20%**
St. Dev	8.46%	32.54%	2.81%	15.67%	8.96%	26.61%	3.37%	14.51%
t-stat	-0.77	-7.08	-1.40	-4.08	-1.24	-12.05	0.16	-8.80
3 Mean	**-0.92%**	**-27.68%**	**-0.39%**	**-11.23%**	**-0.24%**	**-24.56%**	**-0.48%**	**-11.68%**
St. Dev	7.04%	33.21%	3.07%	16.02%	8.23%	27.67%	3.03%	14.81%
t-stat	-1.12	-7.18	-0.76	-4.16	-0.38	-11.73	-1.901 *	-9.01
4 Mean	**-1.97%**	**-29.64%**	**-0.16%**	**-11.40%**	**-0.33%**	**-24.89%**	**-0.07%**	**-11.74%**
St. Dev	6.93%	33.98%	2.70%	16.21%	7.31%	28.68%	2.85%	15.07%
t-stat	-2.43 ***	-7.49	-0.35	-4.14	-0.58	-11.45	-0.28	-8.85
5 Mean	**-0.47%**	**-30.11%**	**-0.84%**	**-12.24%**	**0.37%**	**-24.51%**	**-0.24%**	**-11.98%**
St. Dev	9.19%	35.01%	2.83%	16.47%	7.84%	29.75%	2.89%	15.29%
t-stat	-0.43	-7.40	-1.77 *	-4.38	0.62	-10.86	-1.01	-8.95

Table 6 [cont.]

Panel B: Extreme Book to Market Quintiles, denoted BM

	Qualitative Warnings				Quantitative Warnings			
	Lowest BM		Highest BM		Lowest BM		Highest BM	
Day	AR	CAR	AR	CAR	AR	CAR	AR	CAR
-5 Mean	**-0.37%**	**-0.37%**	**-0.40%**	**-0.40%**	**-0.49%**	**-0.49%**	**-0.57%**	**-0.57%**
St. Dev	8.71%	8.71%	8.20%	8.20%	4.82%	4.82%	4.47%	4.47%
t-stat	-0.53	-0.53	-0.34	-0.34	-2.30 **	-2.30	-1.69 *	-1.69
-4 Mean	**-1.20%**	**-1.57%**	**0.33%**	**-0.08%**	**-0.49%**	**-0.98%**	**-1.16%**	**-1.72%**
St. Dev	7.93%	11.75%	6.48%	10.40%	5.12%	7.00%	3.34%	5.19%
t-stat	-1.92 *	-1.73	0.35	-0.07	-2.16 **	-3.08	-4.13 ***	-3.65
-3 Mean	**-2.14%**	**-3.71%**	**0.48%**	**0.40%**	**-0.70%**	**-1.68%**	**-0.06%**	**-1.78%**
St. Dev	6.49%	13.38%	5.46%	11.72%	4.88%	8.49%	3.93%	6.49%
t-stat	-4.24 ***	-3.52	0.61	0.23	-3.305 ***	-4.31	-0.17	-3.09
-2 Mean	**-1.23%**	**-4.94%**	**0.05%**	**0.46%**	**-1.05%**	**-2.72%**	**-0.87%**	**-2.65%**
St. Dev	8.09%	15.59%	6.92%	13.60%	5.45%	10.06%	4.72%	8.01%
t-stat	-1.95 *	-4.00	0.05	0.25	-4.37 ***	-5.78	-2.22 **	-3.61
-1 Mean	**-2.47%**	**-7.40%**	**1.31%**	**1.77%**	**-1.61%**	**-4.33%**	**-1.01%**	**-3.65%**
St. Dev	8.47%	17.71%	14.30%	19.73%	6.40%	11.93%	4.78%	9.29%
t-stat	-3.74 ***	-5.32	0.64	0.63	-5.72 ***	-7.77	-2.53 ***	-4.44
0 Mean	**-12.43%**	**-19.84%**	**-8.45%**	**-6.68%**	**-9.08%**	**-13.41%**	**-7.61%**	**-11.26%**
St. Dev	17.41%	24.83%	17.07%	26.05%	14.9%	19.08%	12.10%	15.25%
t-stat	-9.08 ***	-10.15	-3.48 ***	-1.76	-13.81 ***	-15.12	-7.49 ***	-8.25
1 Mean	**-10.37%**	**-30.20%**	**-9.74%**	**-16.41%**	**-10.51%**	**-23.92%**	**-6.75%**	**-18.02%**
St. Dev	16.70%	29.92%	16.96%	31.05%	17.11%	25.62%	13.26%	20.17%
t-stat	-7.87 ***	-12.85	-4.02 ***	-3.62	-13.93 ***	-20.09	-6.11 ***	-9.94
2 Mean	**0.90%**	**-29.30%**	**-1.45%**	**-17.86%**	**0.15%**	**-23.77%**	**-1.00%**	**-19.02%**
St. Dev	9.24%	31.30%	4.73%	31.40%	6.38%	26.39%	6.17%	21.07%
t-stat	1.25	-11.91	-2.15 **	-3.91	0.54	-19.43	-1.97 **	-10.04
3 Mean	**-0.30%**	**-29.61%**	**-1.08%**	**-18.94%**	**-0.10%**	**-23.86%**	**-0.78%**	**-19.80%**
St. Dev	7.53%	32.19%	7.05%	32.17%	5.96%	27.04%	5.54%	21.78%
t-stat	-0.51	-11.70	-1.08	-4.03	-0.36	-19.04	-1.69 *	-10.12
4 Mean	**-0.12%**	**-29.72%**	**-0.43%**	**-19.37%**	**0.22%**	**-23.64%**	**-0.08%**	**-19.88%**
St. Dev	7.28%	32.98%	5.99%	32.71%	5.82%	27.63%	5.93%	22.57%
t-stat	-0.20	-11.46	-0.50	-4.07	0.85	-18.38	-0.16	- 9.82
5 Mean	**-0.85%**	**-30.57%**	**-1.13%**	**-20.51%**	**0.06%**	**-23.58%**	**-1.00%**	**-20.88%**
St. Dev	7.07%	33.72%	6.69%	33.37%	6.41%	-28.39%	4.29%	22.95%
t-stat	-1.55	-11.55	-1.19	-4.21	0.20	-17.91	-2.83 ***	-10.14

Table 7
Buy-and-hold abnormal returns from *w+2* to six months after the warning for extreme size deciles and book-to-market quintiles in the sample of stocks that issued profit warnings, February 15th 1998-December 31st 2000.

The decile of smallest stocks that issued qualitative warnings consists of 74 firms. The decile of largest stocks that issued qualitative warnings consists of 35 firms. The decile of smallest stocks that issued quantitative warnings consists of 170 firms. The decile of largest stocks that issued quantitative warnings consists of 140 firms. The quintile portfolio with the lowest book-to-market of firms that issued qualitative warnings consisted of 161 firms. The quintile portfolio with the highest book-to-market of firms that issued qualitative warnings consisted of 43 firms. The quintile portfolio with the lowest book-to-market of firms that issued quantitative warnings consisted of 512 firms. The quintile portfolio with the highest book-to-market of firms that issued quantitative warnings consisted of 143 firms. Quantitative warnings are defined as those that include a forecast for the scheduled earnings announcement to which they refer. Qualitative warnings are defined to be those that only offer the guidance that earnings will be below current expectations. BHAR for an individual stock is calculated as the buy-and-hold return on the stock minus the average buy-and-hold return on the reference portfolio to which it is matched by size and book-to-market, as described in equations (1). BHAR measures sample average buy-and-hold abnormal returns on the sample of stocks that have issued profit warnings, measured from two days after the warning, up to successive months following the warning. The significance of *t*-statistics at levels of 10%, 5% and 1% are denoted by *, **, and ***, respectively.

		Qualitative Warnings		Quantitative Warnings	
		Smallest	Largest	Smallest	Largest
Panel A: BHAR Extreme Size Deciles					
M1	**Mean**	**-2.67%**	**-2.05%**	**-2.61%**	**-0.04%**
	St. Dev	39.26%	12.50%	24.58%	11.08%
	t-stat	-0.58	-0.96	-1.38	-0.04
M2	**Mean**	**-15.03%**	**-1.89%**	**-4.07%**	**2.61%**
	St. Dev	31.15%	13.75%	32.23%	14.23%
	t-stat	-4.15 ***	-0.81	-1.64 *	2.173 **
M3	**Mean**	**-18.01%**	**-7.96%**	**-6.77%**	**0.57%**
	St. Dev	37.56%	18.04%	43.37%	20.16%
	t-stat	-4.12 ***	-2.61 ***	-2.03 **	0.33
M4	**Mean**	**-21.10%**	**-5.24%**	**-7.63%**	**1.02%**
	St. Dev	43.85%	24.53%	54.47%	24.95%
	t-stat	-4.14 ***	-1.26	-1.82 *	0.48
M5	**Mean**	**-25.00%**	**-1.68%**	**-12.78%**	**1.44%**
	St. Dev	56.38%	28.62%	65.55%	27.80%
	t-stat	-3.81 ***	-0.34	-2.54 ***	0.61
M6	**Mean**	**-34.51%**	**-4.71%**	**-7.64%**	**0.90%**
	St. Dev	51.07%	32.35%	84.53%	30.08%
	t-stat	-5.81 ***	-0.86	-1.17	0.35

Panel B: Extreme Book to Market Quintiles, denoted BM

		Qualitative Warnings		Quantitative Warnings	
		Lowest BM	**Highest BM**	**Lowest BM**	**Highest BM**
M1	**Mean**	**-1.23%**	**-5.08%**	**1.72%**	**-2.21%**
	St. Dev	28.49%	20.97%	19.43%	23.48%
	t-stat	-0.54	-1.69 *	2.00 **	-1.12
M2	**Mean**	**-7.30%**	**-5.55%**	**2.02%**	**-4.04%**
	St. Dev	33.43%	32.80%	29.71%	28.79%
	t-stat	-2.77 ***	-1.18	1.53	-1.67 *
M3	**Mean**	**-8.92%**	**-6.86%**	**-2.13%**	**-5.98%**
	St. Dev	43.58%	44.41%	39.02%	33.66%
	t-stat	-2.59 ***	-1.08	-1.23	-2.12 **
M4	**Mean**	**-7.36%**	**-9.51%**	**-1.47%**	**-4.76%**
	St. Dev	56.71%	52.91%	50.36%	42.36%
	t-stat	-1.64 *	-1.25	-0.65	-1.34
M5	**Mean**	**-3.63%**	**-8.28%**	**-3.02%**	**-7.42%**
	St. Dev	102.78%	58.90%	59.89%	43.61%
	t-stat	-0.44	-0.98	-1.14	-2.03 **
M6	**Mean**	**-10.67%**	**-14.41%**	**-1.60%**	**-8.54%**
	St. Dev	81.77%	47.13%	67.38%	47.32%
	t-stat	-1.65 *	-2.14 **	-0.53	-2.15 **

Table 8

Quarterly buy-and-hold abnormal returns on the sample of stocks that issued profit warnings February 15th 1998-December 31st 2000, starting twelve months before the warning.

This sample consists of 2013 firms. BHAR for an individual stock is calculated as the buy-and-hold return on the stock minus the average buy-and-hold return on the reference portfolio to which it is matched by size and book-to-market, as described in equation (1). BHAR measures average buy-and-hold abnormal returns on the sample of stocks that have issued profit warnings, from an initial date 12 months before the profit warning was issued up to the end of successive quarters, measured as 65 trading days. Returns in Q4 are measured up to 5 days before the warning. The significance of *t*-statistics at levels of 10%, 5% and 1% are denoted by *, **, and ***, respectively.

Quarter		BHAR	
Q1	Mean	2.64%	
	St. Dev	45.70%	
	t-stat	2.5902	***
Q2	Mean	-0.76%	
	St. Dev	61.50%	
	t-stat	-0.5578	
Q3	Mean	-6.85%	
	St. Dev	77.02%	
	t-stat	-3.9890	***
Q4	Mean	-24.99%	
	St. Dev	90.76%	
	t-stat	-12.3528	***