CRANFIELD UNIVERSITY

ASAD KAUSAR

# BAD NEWS DISCLOSURES AND MARKET BIAS: DO INVESTORS UNDERREACT?

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SUPERVISOR: RICHARD J. TAFFLER

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## ABSTRACT

The seminal market efficiency paradigm in finance is being increasingly challenged by evidence apparently inconsistent with its predictions. Such "anomalies" tend to show that the market does not fully incorporate information upon its release in an unbiased way. Recent literature in finance identifies two potential types of anomalous market reaction to news disclosures, overreaction, and underreaction. The overreaction phenomenon does not find much empirical support but market underreaction, on the other hand, appears quite robust, particularly in the case of bad news which the market appears to take time to process in many situations. My PhD explores these issues.

The first part of my thesis tests the hypothesis that if investors rationally incorporate new pessimistic (optimistic) information then after controlling for risk, bad (good) news firms will not under- (over-) react. I test this hypothesis in the going-concern modified audit report disclosure domain. Going-concern opinions offer an appropriate test for the underreaction model as such information releases are associated with acute psychological stress and where a clear distinction between bad and good news can easily be made by considering the parallel case of going-concern withdrawal events.

The second part of my thesis extends my work to investigate the market underreaction phenomenon conditional on the underlying bankruptcy regime of the institutional environment. Specifically, I explore the market response to the information content of closely related going-concern modified audit report disclosures (bad news) conditional on the underlying bankruptcy codes in very similar institutional and market environments differing only in the nature of bankruptcy regimes. More specifically, I work with the debtor-friendly U.S. and the creditor-friendly U.K. legal regimes. I hypothesize that investors in a creditor-friendly bankruptcy regime (the U.K.) will react more adversely to the publication of first-time going-concern modified audit report indicating increased risk of loss than do investors in a debtor-friendly bankruptcy regime (the U.S.). This is because of a remarkable divergence across the bankruptcy codes of the two different countries with regards to the rights of claimholders in the event of a default on debt contracts. The idea is to test whether there is any difference in investor response to similar bad news signals highlighting financial distress across different institutional environments.

In the first part of my thesis, I find that there is asymmetric market response to first-time going-concern modified audit report disclosures (bad news) and withdrawal of the going-concern modified audit report disclosure (good news). Using a large sample of 845 U.S. firms from 1994-2002, I find that the market underreacts to going-concern modified audit report disclosures (bad news), resulting in a downward drift of around -16% over the one-year period subsequent to the publication of going-concern modified audit opinion, but treats its withdrawal (good news) consistent with theory with no subsequent abnormal returns. To ensure that my empirical results are robust I employ various methodologies and also conduct additional tests to control for alternative explanations to my market underreaction story such as post-earnings announcement drift, momentum etc. My main results on market underreaction to going-concern modified audit report disclosures remain unchanged. I also test if there is an opportunity to earn profits by trading on this underreaction anomaly but find that any profit opportunity is illusory and highly risky. I conduct additional analyses that

explore the trading behaviour of different classes of investors in my sample firms. This analysis is important as it could highlight whether institutional investors and retail investors exhibit similar trading biases. Results reveal that institutional investors reduce their holdings in such stocks on a timely basis in contrast to retail investors who appear to increase their holdings in such distressed stocks. The evidence is even clearer when such analysis is conducted by splitting my going-concern sample by subsequent outcomes.

I conclude that despite clear adverse signals about the firm's continuing financial viability being conveyed to investors by the publication of the going-concern modified audit report, this information is not being fully impounded by the market, in contrast to the good news conveyed by going-concern withdrawals. My findings add to the existing literature calling into question the ability of the market to rationally price stocks in the case of acute public-domain bad news disclosures, as opposed to good news releases. My results suggest that my evidence of stock mispricing and extended post-going-concern drift might then be explained by a limits to arbitrage argument with naïve (retail) investors keeping stock prices artificially high by trading inappropriately in these stocks due to behavioural biases identified in the literature and skilled investors (professional arbitrageurs) having limited incentive to trade in these small firms because of high costs.

In terms of the second main theme of my thesis, my empirical analysis comparing the market response to going-concern modified opinions in the U.S. and the U.K. shows that, as hypothesized, investors in a creditor-friendly regime (the U.K.) react more adversely, -31%, than investors in a debtor-friendly regime (the U.S.), -18%, in the eight year time-period (1995-2002). One particular reason is that the U.S. bankruptcy regime is biased more towards the rights of debtors, whereas the U.K. regime is biased more towards the rights of creditors and once a firm enters bankruptcy proceedings in the U.K., it is unlikely that stockholders' equity has any residual value. These results provide evidence of the important role of legal regimes on the informativeness of accounting information. My results suggest that as standard-setters pursue uniform accounting and auditing standards across the world, they need to take into account how such standards interact with local legal regimes and consequently their informativeness to investors and other financial statement users. As such, these results present crucial empirical evidence that adds to the ongoing debate about the relevance of global standards among standard-setters, regulators and academics.

Overall, my thesis makes important theoretical and empirical contributions to the behavioural finance, market pricing, and accounting literature in the bad news disclosure domain.

# CHAPTER 1

# INTRODUCTION

The efficient market hypothesis [EMH] has been the central paradigm of finance over the last three decades. This suggests that when markets are efficient stock prices always "fully reflect" all available information (Fama, 1970). Fama (1970) further describes three forms of market efficiency (weak form, semi-strong form, and strong form) and concludes that the evidence contradictory to EMH is rather sparse. Fama (1991), in his sequel to his 1970 paper, updates his review of the literature on market efficiency. In his new version of the EMH he changes the three forms of market efficiency to a) tests for return predictability, b) event studies, and c) tests for private information. In this paper he admits that the evidence for market efficiency for tests of return predictability is controversial. For event studies it is high supportive and for tests of private information it is murky, clouded by the joint hypothesis problem. However, recent empirical research has uncovered further evidence, which has made the EMH paradigm controversial in all its forms. Even with event studies, which in Fama's opinion presented the cleanest support, evidence against market efficiency is now also exposed. Recent literature in finance identifies two potential types of anomalous market reaction to news disclosures - overreaction, and underreaction. The overreaction phenomenon does not find much empirical support but market underreaction, on the other hand, appears quite robust. Existing research in accounting and finance suggest incomplete market response to various news events leading to a post-event drift persisting for several months. This market underreaction phenomenon relates to slow assimilation of information revealed by these news events into stock prices. A key empirical finding of studies in this area is that the market is particularly

biased in recognising the full implications of adverse news disclosures as opposed to events conveying optimistic news. The classic case is that of the post-earnings announcement drift (Ball and Brown, 1968; Bernard and Thomas, 1989, 1990). Bernard and Thomas (1989) show that their low SUE (standardized unexpected earnings) portfolio (bad news) has abnormally low returns compared with their high SUE portfolio (good news). Similarly, there is evidence of analyst underreaction to negative information (Easterwood and Nutt, 1999 and Abarbanell and Lehavy, 2003). Other events/disclosures include market reaction to stock recommendations (Womack, 1996), dividend initiations/increases and omissions/reductions (Michaely, Thaler and Womack, 1995; Asquith and Mullins, 1983) and the disclosure of favourable and unfavourable news (Chan, 2003). Important point to note is that in all these studies results are largely driven by bad news stocks/portfolios.

However, most of these studies fall prey to one of the two key problems in exploring market underreaction to bad news. First, many of these studies use events that are management's voluntary decision choices with non-homogenous motivations. Second, such disclosures generally do not relate to extreme events such as financial distress. Thus, existing studies use events which are ambiguous in terms of their information content making it difficult to directly associate them with changes in firm viability or portraying clean bad news signals uniformly across all firms. Therefore, I argue that events in the financial distress domain are most suitable for my empirical investigation as they are very clear and unambiguous in terms of their information releases. For instance, firms that move towards the financial distress domain clearly portray bad news making it difficult for investors to deal with this appropriately because of the associated psychological pain. Conversely, firms that turnaround

provide good news leading to psychological "gain". Apart from Dichev and Piotroski (2001) there are not many studies that examine market reaction to news events in this domain. Even Dichev and Piotroski (2001), who focus on the impact of bond rating changes on stock returns, work with only a noisy estimate of a firm's likelihood of default (Vassulou and Xing, 2004).

In this thesis, I explicitly and thoroughly examine the market underreaction anomaly conditional on the nature of the news in the U.S. by using the going-concern opinion as my news event. Going-concern audit disclosures offer an excellent test for the behavioural finance model of market underreaction because such disclosures are in the financial distress domain and thus of potentially acute impact on investors. More importantly the information conveyed by the going-concern event is clear and unambiguous. A going-concern modification (bad news) highlights the increase in the uncertainty of a firm's operations which, in essence, increases financial distress risk. Whereas, in comparison, a withdrawal of a modified opinion (good news) highlights a decrease in a firm's financial distress risk. Furthermore, I extend my analysis to explore how different classes of stockholders change their holdings around the bad news event in my sample of going-concern modified firms. Since I am investigating a behavioural finance issue through a very important accounting system disclosure; my thesis contributes to both the behavioural finance and accounting areas.

The going-concern assumption is one of the basic principles underlying the preparation of financial statements. Statement on Auditing Standards (SAS) No. 59 – The Auditor's Consideration of an Entity's Ability to Continue as a Going-Concern (AICPA, 1988) stresses that the going-concern report is an important signal for

financial statement users. No consensus, however, exists about its utility to investors or its relevance in market pricing. Previous market-based research is limited to examining stock price reactions to going-concern opinions around the announcement date only (e.g., Firth, 1978; Chow and Rice, 1982; Dodd, Holthausen, and Leftwich, 1986; Jones, 1996; Carlson, Glezen, and Benefield, 1998) and with various research design issues arising (Bailey, 1982). No U.S. study has explored this issue on a longer-term basis apart from the specialised studies of Willenborg and McKeown (2001) and Weber and Willenborg (2003), who explore the post-listing performance of micro-cap IPOs with going-concern audit opinions in their pre-listing financial statements.

Additionally, there is no direct evidence on the market reaction to going-concern opinion withdrawals (good news), although an early study (Field and Wilkins, 1991) does explore the short-term market reaction to withdrawn audit qualifications in general. The only study with direct relevance to my thesis is that of Taffler, Lu, and Kausar (2004). This, however, is restricted to the analysis of one-year post-going-concern returns only for a small sample of U.K. firms operating under a creditor-friendly bankruptcy regime in contrast to the debtor-friendly insolvency code operating in the U.S. (La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 1998; Franks, Nyborg, and Torous, 1996).

Interestingly, the divergent bankruptcy codes in the two institutional environments and similar information cue in the financial distress domain (i.e. going-concern opinion) further enable me to extend my thesis to study the market underreaction anomaly conditional on the bankruptcy regime underpinning the firms in question.

The motivation behind such an investigation comes from the fact that under the two bankruptcy regimes there is differential treatment of the rights of the claimholders in the event of default on debt contracts, (e.g., see Franks et al., 1996; La Porta et al., 1997). Once a firm enters bankruptcy proceedings in the U.K., it is unlikely that stockholders' equity has any residual value, whereas this is very rare in the U.S. Consequently, it is possible that a going-concern opinion in the U.K., which signals increased default risk, will have a more negative market response than a going-concern opinion in the U.S. In the U.K., the going-concern auditing regime under SAS 600 (APB, 1993) and SAS 130 (APB, 1994) is based on, and is very similar to, SAS No. 58 (AICPA, 1988a) and SAS No. 59 (AICPA, 1988b) with equivalent auditing standards and procedures. Furthermore, various studies in the corporate governance area point out that the U.S. and the U.K. have very similar capital market structures. Therefore, I suggest that, despite the relative uniformity of the auditor's going-concern opinion across the two countries, investors place differential importance on this information cue and this is largely a result of differences in the underlying bankruptcy regimes.

In summary, this thesis aims to explore the medium-term stock price behaviour of firms with first-time going-concern modified (GCM) audit opinions and to examine the different market responses to the GCM event itself (bad news) and for those cases where the going-concern opinion is subsequently withdrawn (good news). Therefore, going-concern opinions constitute mandatory unambiguous public-domain bad news events offering a clean test for studying market reaction to such bad and good news disclosures. I additionally explore the different trading behaviours of the three classes of stockholder (institutions, insiders, and retail investors) for the full GCM sample

and conditional on GCM firms' ex post outcome to provide insight into how these different types of market participant react to this bad news. Such analysis could further educate us about investor behaviour in this financial distress domain.

In the second part of this thesis, I proceed to explore the market response to the information content of the going-concern modified audit report disclosures (bad news) conditional on the underlying bankruptcy codes in the debtor-friendly U.S. and the creditor-friendly U.K. regimes. The idea is to see whether there is any difference in investor response to similar bad news signals highlighting financial distress across the two institutional environments. In particular, do investors place different weights in their stock price response to firms with going-concern modified auditor opinion in the U.S. and the U.K.?

Specifically, the aims and objectives of my study are:

1. To test the market underreaction hypothesis in the domain of financially distressed firms where the information conveyed by the event is unambiguous, clearly representing "*loss*" in a psychological context.

2. To investigate the market underreaction hypothesis conditional on the nature of the news (good or bad) revealed by the event in the context of firms which experience a shift in their bankruptcy risk. This test is primarily based on the existing empirical evidence suggesting weak evidence of abnormal market response, if at all, after the good news release event, whereas, much stronger results indicating the robustness of the market underreaction anomaly.

3. To test each of the three theoretical behavioural finance models of Daniel, Hershleifer, and Subrahmanyam (1998), Barberis, Shleifer, and Vishny (1998), and Hong and Stein (1999). Such an investigation allows me to empirically test the explanations offered by these models for the market underreaction phenomenon and also assess ex ante validity of these models.

4. To test any abnormal returns against mispricing arguments by controlling for, and/or to potentially uncover, additional factor(s) that might underlie the underreaction phenomenon.

5. To test any abnormal returns for limits to arbitrage arguments. Lesmond, Schill, and Zhou (2004) in the case of momentum trading and Taffler, Lu, and Kausar (2004) for U.K. going-concern modified opinions, find that profit opportunities are illusory and after incorporating most of the trading costs involved in the arbitrage process, no profits can be made.

6. Taffler, Lu, and Kausar (2004) in their study of U.K. GCM firms speculate that institutional investors are also prone to behavioural biases. I investigate trading patterns of different classes of investors to provide specific evidence on this issue.

7. To test for differences in market response to first-time going-concern modified audit opinions conditional on the underlying bankruptcy regime of the institutional environment. The idea is to provide evidence on the effect of the interaction of local bankruptcy codes with a similar information signal

indicating increase in financial distress on security prices in the U.S., a debtor-friendly regime, and the U.K., a creditor-friendly regime.

8. To conduct additional tests by controlling for other factors that might explain any difference in investor response to the GCM signal in the U.S. and the U.K. environments.

9. Last but not least, to provide a possible alternative explanation to limits to arbitrage for the market underreaction phenomenon drawing on both extant behavioural finance as well as complementary psychoanalytic perspectives.

I form appropriate hypotheses in my exploration of my above-mentioned research questions and then use different performance measurement and performance evaluation methodologies to test these. Specifically, for my main analyses, I rely on buy-and-hold abnormal returns derived using the control firm method (Barber and Lyon, 1996). As with any empirical study, results should be robust to alternative approaches; I also employ other methodologies present in the literature. To test for other confounding/alternative explanations cross-sectional regressions are also run.

Main findings of my thesis are:

There is differential market reaction to going-concern modified audit opinions (bad news) and going-concern modified withdrawn audit opinions (bad news). I find negative stock price reaction following a GCM announcement lasts for a year, and is around -16%, indicating clear market underreaction to this bad news event. Conversely, no similar abnormal return pattern is found after GCM withdrawals (good

news), and is consistent with theory. I also provide evidence that good news about my GCM firms' future prospects, as highlighted by a withdrawn going-concern opinion, is correctly anticipated by the market in the period leading up to the following audit report date. Additionally, the underperformance of my sample firms is restricted to GCM firms with negative earnings surprise, consistent with market focusing on earnings while ignoring the full implications of the GCM signal.

On the other hand, I find high transaction costs associated with trading in my sample stocks render arbitrage opportunities unprofitable and very risky for rational investors. Furthermore, by exploring trading patterns of different investors in response to the going-concern opinion, I find that institutional investors reduce their holding in such stocks, especially in the most distressed of stocks in my GCM sample. Also, by deduction, these results show that it is the retail investors who are trading inappropriately in these stocks and keeping prices artificially high. Another key finding of my thesis is that investors react more adversely to the first-time going-concern modified audit report in a creditor-friendly regime (i.e. U.K.) as opposed to a debtor-friendly regime (i.e. U.S.). These findings have not been documented in the literature before.

The rest of the study is organised as follows: chapter two surveys the existing literature, chapter three presents my research framework, discusses the events/disclosures to be investigated and develops the hypotheses to be tested, chapter four provides the details of data and methodology to be employed, chapter five reports the results of market reaction to good and bad news, chapter six tests for explanations already documented in the literature, chapter seven investigates a limits to arbitrage

story and also presents evidence on holding patterns and trading activities of different investor classes, chapter eight presents the results of market response to bad news conditional on the underlying bankruptcy code of the institutional environment, and chapter nine draws conclusions from the research, discusses limitations and explores possible extensions for further work.

# CHAPTER 2

# LITERATURE REVIEW

## 2.1. Introduction

In this chapter I review the literature on anomalous market reaction to news events/disclosures. The existing literature on anomalous market reaction is split into market over- and underreaction studies. A review of each of these areas follows.

## 2.2. Market Overreaction

Overreaction is observed when asset prices initially rise above/below their fundamental values following a news release and gradually revert to fundamental value over a long period of time. This phenomenon was initially identified by DeBondt and Thaler (1985) and again confirmed by them in 1987.

In their 1985 study they show that when stocks are ranked on their three- to five-year past returns, firms with prior extreme negative stock returns (losers) seem to outperform those with prior extreme positive returns (winners). They attribute these long-term return reversals to investor overreaction. This portfolio formation strategy and the evidence of subsequent long-term return reversals is essentially the key test of overreaction in the accounting and finance literature.

In their 1987 study they investigate the same issue taking into account the possibility of overreaction to earnings releases. In support of the possibility that their earlier results could be driven by overreaction to earnings news, DeBondt and Thaler point to evidence that indicates a pattern in earnings similar to that found in returns. That is, after losers (winners) experience earnings declines (increases) during the portfolio

formation period, earnings move in the opposite direction in the subsequent test period. This evidence was consistent with a failure of stock prices to reflect the fact that annual earnings do not strictly follow a random walk, but show some mean reversion in the distribution tails (Brooks and Buckmaster, 1976).

The evidence presented by DeBondt and Thaler (1985) posed a serious threat to the market efficiency paradigm and was therefore subject to serious criticism. Ball and Kothari (1989) suggest that prior winners (losers) experience decreases (increases) in beta that are sufficiently large to explain nearly all of the estimated abnormal returns to the DeBondt and Thaler (1985) strategy. Specifically, Ball and Kothari (1989) document that when one controls for beta shifts, the DeBondt and Thaler (1985) strategy generates abnormal returns that are never statistically significant in any of the five post-ranking years.

Zarowin (1989) also presents evidence against the overreaction hypothesis of DeBondt and Thaler (1985). Most notably, he matches the DeBondt and Thaler sample by size and examines whether, when controlling for size, the anomaly reported by DeBondt and Thaler remains. Zarowin finds the very converse to be the case. For size matched portfolios there is no sign of any gains from buying losers and selling winners.

Zarowin (1990) conducts further research on company size and overreaction and draws the following conclusion:

*"The crucial point is that such a size discrepancy indicates the need to control for size when comparing the return performances of winners vs. losers, because it is well known that smaller firms outperform larger firms. Without such a control, we cannot know whether differential size or investor overreaction is responsible for the tendency of prior period losers to outperform prior period winners in the subsequent period" (Zarowin, 1990, p.118).*

However, subsequent to Zarowin's work Chopra, Lakonishok, and Ritter (1992) again present evidence of market overreaction using the same sample as Ball and Kothari (1989). They uncover the problem of survivorship bias in the Ball and Kothari (1989) study. They report that 22% of extreme losers are delisted, while only 8% of extreme winners are delisted. Since mean reversion is concentrated in loser companies Chopra, Lakonishok, and Ritter (1992) suggest the Ball and Kothari (1989) estimates of the degree of overreaction are likely to be a substantial underestimate due to sample selection bias. Another fundamental difference between the two studies is that Chopra, Lakonishok, and Ritter (1992) use empirical estimates of beta while Ball and Kothari (1989) use assumed values implied by the Sharpe-Lintner capital asset pricing model (CAPM).

Any definite conclusions about the proper interpretation of the DeBondt and Thaler (1985, 1987) results are difficult to draw at this stage; however the following more recent evidence should help us draw certain conclusions. Conrad and Kaul (1993) undertake a replication of the DeBondt and Thaler (1985) study, but employ buy and hold returns as a measure of contrarian profits or abnormal returns. On doing so, they discover that the evidence of contrarian profits vanishes, with the exception of low

price firms. Therefore, they conclude that such returns are mostly attributable to measurement error in computing long-term returns. This renders evidence in favour of the overreaction hypothesis tenuous at best. Ball, Kothari and Wansley (1993), and later on Conrad and Kaul (1997), show that profits from overreaction are largely generated by bid-ask bounce in transaction prices and accounting for this bounce eliminates all the profits from price reversals.

Other studies of this overreaction hypothesis (e.g. Jones, 1993; Ball, Shanken and Kothari, 1995 and Loughran and Ritter, 1996) also uncover additional return measurement errors including the microstructure effects of small stocks, portfolio formation date issues, differences in returns in up and down markets and virtually all abnormal returns being concentrated in January. Measurement problems are thus apparent in contrarian portfolio returns and therefore any empirical results consistent with overreaction should be viewed with some scepticism. Finally, Fama and French (1996) find that a rational asset-pricing model generates the long-term reversals of DeBondt and Thaler, which are captured by Fama and French's (1993) multifactor asset-pricing model. Fama further explains that:

*"In a nutshell, return covariation among long-term losers seems to be associated with a risk premium that can explain why they have higher future average returns than long-term winners." (Fama, 1998, p.287)*

In parallel, and more recently, Kadiyala and Rau (2004) examine four corporate events (stock-financed acquisitions, cash-financed acquisitions, tender offers, and open-market share repurchases) and find no evidence to support the overreaction

model in their study. Finally, Ang and Zhang (2004) conduct a large-scale simulation study to address several issues that are related to testing long-horizon abnormal returns. What they find is that the power of tests for long-horizon abnormal returns (3 to 5 years) falls considerably and it is even worse for small firms. This means that one cannot be completely sure of whether long-horizon abnormal returns are due to measurement errors, an unknown risk factor, or overreaction.

## 2.3. Market Underreaction

Market underreaction, on the other hand is still a robust phenomenon. It is a phenomenon in which new information (event/disclosure) when released is not assimilated quickly into the stock price resulting in post-event drift, suggesting slow adjustment to fundamental value over a period of time. In the last decade, empirical research in finance and accounting has uncovered a whole range of corporate events/disclosures, which present evidence of market underreaction. I review the empirical evidence on these events/disclosures in the following section.

### *2.3.1. Empirical evidence of market underreaction*

Empirical evidence of market underreaction has grown substantially in the last decade. The drift anomaly was initially discovered by Ball and Brown (1968) in their study on earnings announcements. They were the first to document that, subsequent to the announcement of earnings, cumulative abnormal returns (CARs) continue to drift up for "good news (earnings increase)" and down for "bad news (earnings decrease)", suggesting a delay in information assimilation into stock prices. This underperformance seems to continue from an initial reaction on day 1 through to day 180 and in some cases even longer than that. This seminal paper was quickly followed

by a whole range of studies documenting the same phenomena.[1] However, these earlier studies on post-earnings announcement drift suffered from a variety of limitations which may have biased their results.[2] But even after controlling for the known research design flaws, post-earnings announcement drift remained apparent. Among the more recent evidence on the possibility of an incomplete initial response to earnings announcements, the most striking evidence appears in Bernard and Thomas (1989, 1990), Freeman and Tse (1989), and Mendenhall (1991). Each of these studies examines the possibility that post-earnings announcement drift is due to the fact that stock prices fail to reflect fully what current earnings imply, on average, about earnings in subsequent quarters suggesting investors underreact to earnings information. Liu, Strong and Xu (2003) test for the presence of post-earnings announcement drift in the U.K.. They also find evidence of significant post-earnings announcement drift which is robust to alternative controls for risk and market microstructure effects.

Another event which has questioned the informational efficiency argument is the long-term market reaction to corporate offerings, which include initial public offerings (IPOs), seasoned equity offerings (SEOs) and debt offerings. Ritter (1991) originally documented long-run underperformance of common stocks subsequent to initial public offering. He studied 1,526 IPOs over a period of 10 years (1975-1984) and found that these issues underperform relative to a group of matched firms listed on the American and New York stock exchanges. The underperformance of IPOs was again confirmed by Loughran and Ritter in 1995 and then again in 2000. Ritter and Welch (2002) in their recent paper review empirical evidence on long-run

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[1] E.g. Jones and Litzenberger (1970), Joy, Litzenberger and McEnally (1977), Rendleman, Jones, and Latane (1982) and Foster, Olsen, and Shevlin (1984).
[2] See Ball (1978), Foster, Olsen, and Shevlin (1984) and Bernard and Thomas (1989) for a discussion.

performance of IPOs. The authors generally find that the evidence is more consistent with poor long-run performance of firms following IPOs. Ritter and Welch (2002) also discuss potential reasons in the literature for this long-run underperformance, finally favouring the behavioural point of view as the potential explanation for the IPO long-run underperformance phenomenon.

Spiess and Affleck-Graves (1995) study long-run stock returns following seasoned equity offerings to determine whether managers' ability to exploit overvaluation opportunities is a broadly based market phenomena, or merely due to the large information asymmetry in the IPO market. The evidence suggests that long run, post-offering underperformance is not unique to IPOs and managers do exploit these opportunities. However, irrational optimism or any unknown risk dimension cannot fully explain the magnitude and the robustness of the underperformance observed in the data.

In another study Spiess and Affleck-Graves (1999) document economically and statistically significant long-run stock price under-performance following both straight and convertible debt offerings. However, their results are limited to smaller, younger and NASDAQ listed firms and among issues that are not investment grade. In addition, such underperformance is also limited to offerings that occur in high volume periods. Generally, the results are more consistent with market underreaction to negative information conveyed at the time of the issue announcement.

Market reaction to dividend policy changes, a major corporate finance issue, also presents evidence inconsistent with market efficiency. Michaely, Thaler and Womack

(1995) investigate immediate (3-day) reaction to dividend initiation and omission announcements and long-run post-announcement price performance. They also investigate systematic reaction to good (dividend initiations) and bad (dividend omissions) news. Results indicate that initiating (omitting) firms continue to generate positive (negative) abnormal returns from the event day till the end of the third year. But the results generally are more robust for the omissions sample and show significant drift regardless of the benchmark portfolio used. The drift after initiations, however, is significant only for some benchmarks and time intervals. In terms of market reaction this study presents evidence on asymmetric market reaction to good and bad news, being more pronounced for bad news particularly in the long run. The authors examine various reasons for such stock price behaviour and find evidence consistent with a market underreaction hypothesis.

Research in the area of mergers and acquisitions also presents evidence consistent with long-term market underreaction. Agrawal and Jaffe (2000) summarise previous empirical evidence on long-run stock returns following acquisitions. These authors conclude that long-run performance is negative following mergers but non-negative (sometimes positive) following tender offers.[3] However, the results of various studies they review are economically and statistically significant for mergers but this is not the case for tender offers. Tender offers only offer a very weak evidence of positive abnormal returns. Agrawal and Jaffe (2000) also summarise the studies which offer potential explanations for underperformance following mergers. The empirical evidence in these studies does not find much support for slow adjustment to merger

[3] General offer made directly to the target firm's shareholders to buy their stock.

news or EPS myopia.[4] However, method of payment and performance extrapolation receive greater support but still fails to provide a satisfactory explanation for negative long-run market underperformance following mergers.

Various other events/disclosures also add to the evidence on market underreaction. Ikenberry, Lakonishok and Vermaelen (1995) in their paper hypothesise that the market treats share repurchases with scepticism, leading to prices adjusting slowly over time (Underreaction Hypothesis). They examine long-run firm performance following open market repurchase announcements in the decade 1980-90. Their results reveal that on average the market underreacts to open market share repurchase announcements. Similar results are found in the UK and Canada suggesting underreaction to share repurchases is a robust phenomena.[5]

Correspondingly, studies which examine the information content of insider trades and its market response do not find any major stock price changes around the time of trading or around reporting dates.[6] However, evidence suggests that insiders' trades are informative over a longer investment horizon, suggesting that the market underreacts to this information. In addition, informativeness of insiders' activities derives exclusively from purchases, while insider selling appears to have no predictive ability. Results show that the purchase portfolio outperforms the market by around 7% per year.

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[4] Earnings per share myopia may be defined as a disproportionate emphasis or fixation on the immediate postmerger impact of a merger on earnings per share as opposed to a consideration of longer-term consequences (Block, 2002).

[5] See Lasfer (2000) for the UK and Ikenberry, Lakonishok, and Vermaelen (2000) for Canada.

[6] See e.g. Lakonishok and Lee (2001) and Jeng, Metrick, and Zeckhauser (1999).

Stock splits also generate market reaction consistent with the idea of slow incorporation of new information into stock prices. Although being a cosmetic event (because it does not directly affect future cash flows or firm risk characteristics) the market reacts favourably to split announcements. Two studies (Ikenberry and Ramnath, 2002 and Ikenberry, Rankine and Stice, 1996) provide evidence that splitting generates significant excess returns in the long-run. They also find that market reaction is greater for small firms, low book-to-market firms and firms splitting to low share prices. Overall, the results appear to be consistent with market underreaction as they provide evidence of incompleteness of the immediate market reaction to news.

Empirical evidence on momentum is rather more interesting as one cannot attribute market underreaction or overreaction as caused by any specific firm event. The momentum anomaly initially documented by Jegadeesh and Titman (1993) shows that when stocks are ranked on the basis of their past performance (usually 1 year), stocks that have performed extraordinarily well continue to perform well over the following 12 months. Conversely, stocks with poor previous performance continue to perform poorly. This suggests that the market takes time in assimilating information about these stocks providing abnormal returns to investors over a period of up to one year. However, the empirical evidence on the sources of momentum effects is controversial. Chan, Jegadeesh, and Lakonishok (1996) and Hong, Lim, and Stein (2000) find evidence consistent with the underreaction explanation. Lee and Swaminathan (2000) and Jegadeesh and Titman (2001) look at long-horizon returns suggesting delayed overreaction is driving momentum. However, Nagel (2001) shows that long-term reversals of momentum profits are essentially a manifestation of the well-known

book-to-market effect and these reversals disappear when returns are adjusted for size and book-to-market. Eisdorfer (2004) shows that approximately 40% of the momentum profit is generated by delisted firms and these firms only account for 10% of the firms in momentum portfolio. This finding is more consistent with the underreaction models of the momentum. Therefore, it appears, we are left with few answers to the underreaction phenomenon.

Another strand of the literature, involving financial intermediaries, has also presented evidence of underreaction. Specifically, financial analysts have shown a tendency to underreact to negative information while making earnings forecasts or revisions (Abarbanell and Lehavy, 2003; Easterwood and Nutt, 1999, and Amir and Ganzack, 1998). As my primary concern is investigating investor reaction to good and bad news, therefore market reaction to analyst recommendation changes should shed further light on this phenomenon. Womack (1996) analyses the effect of recommendation (buy/sell) changes of stocks by security analysts at major U.S. brokerage firms. He only examines changes to and from the extremes (added to/removed from buy or added to/removed from sell). The post-recommendation drift associated with a buy is significant but short-lived. The mean size adjusted return for the first post-event month beginning two days after the recorded date of buy recommendation is +2.4%. Sell recommendations, however, are associated with post-recommendation drift of -9.1% over a longer six-month post-event period. This phenomenon is also investigated and confirmed in the U.K. by Ryan and Taffler (2005). They find a significant post-recommendation drift lasting for at least six months after new sell recommendations but no significant drift subsequent to new buy recommendations. This suggests that share price is significantly influenced by

analysts' recommendation changes, not only at the time of recommendation change but also in subsequent months. These results suggest underreaction and asymmetric price response to buy and sell recommendation changes.

Barber, Lehavy, McNichols and Trueman (2003) using a calendar-time portfolio approach for the period 1996-99 also find support for asymmetric market response for extreme recommendation changes. Their most highly recommended stocks earn a significant 3.97% average annual market adjusted return, while the average annual market-adjusted return on the least favourably rated stocks is a significant -9.06%. However, the opposite is true for the years 2000 and 2001. These results prevailed during most months of years 2000 and 2001, regardless of whether the market was rising or falling, and was observed for both technology and non-technology stocks. Their anomalous results for 2000 and 2001 appear to suggest strong underperformance for highly recommended stocks and vice versa for the least favorably recommended. However, this unexpected result disappears once size, book/market and momentum factors are controlled for (see their Table 6). This suggests that their results are then broadly similar to their earlier study (Barber, Lehavy, McNichols and Trueman, 2001) using data from 1985-1996, demonstrating a delay in reacting to recommendation changes.

Finally, market response to bond rating changes also favours the underreaction hypothesis. There are several reasons to believe that bond-rating changes offer another powerful and interesting setting for investigation in long-term returns. First, bond-rating changes are common and well-disseminated information events. Second,

existing research suggests that bond-rating changes capture economically significant shifts in the firms' economic conditions.

In their interesting study, Dichev and Piotroski (2001) find evidence of underreaction to downgrade announcements. They thoroughly investigate long-run returns following bond-rating changes. A comprehensive sample size (1970-97) is used allowing powerful statistical results to be derived. The authors use both cumulative abnormal return (CAR) and buy and hold abnormal return (BHAR) methodologies for measuring abnormal returns, controlled for size and book to market affect. Apart from portfolio-level analysis, Dichev and Piotroski also run cross-sectional regressions to uncover any dependency issues. Results confirm an economically large and statistically significant underperformance following downgrades but no reliable abnormal returns following upgrades. Most of the underperformance of downgrades occurs in the first year after the announcement, with negative abnormal returns of the magnitude of -10 to -14% a year. Panel A of Table IV in Dichev and Piotroski's (2001) study shows highly significant first year abnormal returns (CAR = -9.57% (t = -10.25) and BHAR = -10.14% (t = -10.47)) following bond downgrades whereas the opposite is not true following bond upgrades (CAR = -0.93% (t = -1.29) and BHAR = -0.33% (t = -0.39)).This underperformance following bond downgrades also seems to extend to the second and third year after the announcement, but the size of the abnormal returns are substantially reduced. This study suggests that investors are biased in their reaction to bad news and remain so for long periods of time whereas good news is immediately reflected into share prices.

Dichev and Piotroski (2001) also test abnormal returns conditional on firm size, credit quality and preceding quarterly earning surprises. Their results are generally robust; however, the phenomenon of underreaction to bond downgrades is more pronounced for small firms with non-investment grade debt. This means that the negative effect is more severe for the most extreme cases (low credit quality or higher financial distress risk). Griffin and Lemmon (2002) and Dichev (1998) also find similar results for their O-score/z-score based portfolio analysis of U.S. stocks in general.

Dichev and Piotroski finally suggest three possible explanations for the unusually low long-term returns they discover, but present reasonable justification to discard the first two issues i.e., systematic risk factor and ex-ante insufficient information arguments. They finally make a case for market inefficiency by siding with behavioural biases being the possible explanation for underreaction.

On the whole, findings of the above mentioned empirical studies appear to be robust to commonly adduced explanations such as systematic risk, period-specific return patterns, and long-term return measurement methodology problems. Proponents of market efficiency still dispute the idea of underreaction by calling such empirical regularities chance events and/or as falling prey to other robustness checks (e.g. Fama, 1998). Nonetheless, even such critics are forced to admit on the basis of the compelling empirical evidence that the anomalous market reaction to post-earnings announcement drift and momentum are both robust phenomena. Fama (1998) calls these two anomalies above suspicion and Kothari (2001) commenting on the earnings phenomena says that "the survival of the anomaly 30 years after it was first

discovered leads me to believe that there is a rational explanation for it, but evidence consistent with rationality remains elusive" (p.196).

An important aspect of the empirical evidence suggesting long-term market underreaction is that it also highlights differential market responses to good and bad news. Table 1 shows the market reaction to the above-mentioned studies categorised as good and bad new events. The distinction between good and bad news provided in the table is based on market response only. By analysing table 2.1 we can see that market underreaction is more pronounced in the case of bad news events as compared to good news events. The question that now arises is "Why do market participants appear to have great difficulty in assimilating bad news on a timely basis in their investment decisions as compared to good news?"

**Table 2.1 – Asymmetric Market Response to Good and Bad News Events**

| *Event* | *Study* | *Market Response* | *Abnormal Returns and Time Period* |
|---|---|---|---|
| Initial Public Offering | Loughran & Ritter (2000) | Negative | -4% (1 year) |
| Seasoned Equity Offering | Spiess & Affleck (1995) | Negative | -5% (1 year) |
| Debt Offerings | Spiess & Affleck (1999) | Negative | -4.8% (1 year) |
| Bond Rating Changes<br>a) Upgrades<br>b) Downgrades | Dichev & Piotroski (2001) | Positive<br>Negative | Not significant<br>-10% (1 year) |
| Stock Splits | Ikenberry & Ramnath (2002) | Positive | 9% (1 year) |
| Share Repurchases | Ikenberry et al. (1996) | Positive | 7.9% (1 year) |
| Dividend<br>a) Initiation<br>b) Omission | Michaely, Thaler & Womack (1995) | Positive<br>Negative | 7.5% (1 year)<br>-11% (1 year) |
| Analyst Recommendations<br>a) New Sell<br>b) New Buy | Womack (1996) | Negative<br>Positive | -9.1% (6 months)<br>2.4% (1 month) |
| Earnings Announcement[7] (U.S.)<br>a) High SUE[8] (Long position portfolio)<br>b) Low SUE (Short position portfolio) | Bernard & Thomas (1989) | Positive<br>Negative | 2.04% (9 months)<br>-6.03% (9months) |
| Earnings Announcement (U.K.)<br>a) High Earnings Surprise<br>b) Low Earnings Surprise | Liu, Strong and Xu (2003) | Positive<br>Negative | Not significant<br>$\acute{\alpha}$ = -0.51 per month[9] |
| Acquisitions<br>a) Mergers | Gregory (1997)<br><br>Loughran and Vijh (1997) | Negative<br><br>Negative | -11.8% to -18% (2 years)<br><br>-15.9 (5 years) |
| b) Tender offers | Loughran & Vijh (1997) | Positive | Not significant |

[7] The abnormal returns shown here are the averages of cumulative abnormal returns on small, medium, and big stock portfolios.
[8] Standardised unexpected earnings.
[9] They use Fama and French's (1993) three-factor time series model. See their Panel C of Table 1.

### *2.3.2. Possible explanations for market underreaction*

Over thirty years of research has been conducted and we still fail to have a satisfactory explanation for such anomalous market behaviour. Rational asset pricing models[10] based on systematic risk explanations or models based on volatility (e.g. Veronesi, 1999) all fail to account for such anomalous market behaviour.

On the contrary, such apparent anomalous market reaction might be better explained by behavioural finance concepts drawing on cognitive psychology to explain investor decision-making processes. Behavioural finance seeks to predict systematic financial market implications of psychological decision processes without trying to define 'rational' behaviour or label decision-making as faulty (Olsen, 1998).

Tversky and Kahneman (1974) present the idea of application of heuristics or "rules of thumb" when people are faced with complex judgements and decisions. They argue that in many cases these short cuts yield very close approximations to the "optimal" solutions suggested by normative theories. The advantage of application of these heuristics is that they reduce time and effort required to make reasonably good judgements and decisions. Much of the behavioural finance literature is based on this idea. It presents the basic argument that investors are subject to certain information processing biases and do not rationally incorporate the information revealed by an event. Although there are a number of heuristics offered in the behavioural finance literature the most important examples specifically and potentially pertaining to market underreaction are: representativeness, anchoring and adjustment (conservatism), overconfidence, and loss aversion.

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[10] The capital asset pricing model (CAPM) of Sharpe (1964) and Lintner (1965), Ross's (1976) arbitrage pricing theory, or Merton's (1973) intertemporal capital asset pricing model.

*2.3.2.1. Representativeness*

The representativeness heuristic (Tversky and Kahneman, 1974) involves assessing the probability of a state of the world based on the degree to which the evidence is perceived as similar or typical of the state of the world. This involves the concept of judgement based on stereotypes without relying on the underlying characteristics of a particular state of the world. Here people tend to ignore the laws of probability and base their judgements on how representative a particular state is to them. "A person who follows this heuristic evaluates the probability of an uncertain event, or a sample, by the degree to which it is (i) similar in its essential properties to the parent population, (ii) reflects the salient features of the process by which it is generated" (Tversky and Kahneman, 1974, p.33). An important manifestation of the representativeness heuristic is that people think they see patterns in truly random sequences. For example, the DeBondt and Thaler (1985) findings discussed above, suggesting that past losers come to be undervalued and past winners come to be overvalued, could be explained on the basis of investors relying on the representativeness heuristic and become overly pessimistic about past losers and overly optimistic about past winners. DeBondt and Thaler (1989) present evidence in support of such a claim. Solt and Statman (1989) test the hypothesis that most investors prefer stocks of growth companies because they conclude that growth stocks are stocks of growth companies. But the authors in fact find that growth stocks actually provide inferior returns over the period of their study. Similarly, Shefrin and Statman (1995) present the argument that investors tend to identify good stocks as stocks of good companies, which may or may not be true. This idea supports the notion that investors suffer from the representative heuristic by projecting the pattern

of past performance into the future. Therefore, investors suffering from the representative heuristic will always think that winners will always outperform losers. A recent study by Chan, Frankel and Kothari (2004) tests the representative heuristic by using past trends and sequences in financial performance to predict future returns. They use growth rates in sales, net income, and operating income over the past five years (long-term) and one year (medium-term) to form portfolios of low and high growth firms. They also test the momentum anomaly by formulating portfolios based on past one year returns. Their results somewhat support the idea that investors, due to the operation of conservatism bias, extrapolate past performance (both financial and stock return) into future stock returns which produces underreaction in the medium-term (up to one year) while finding no support for longer-term (up to five year) market overreaction (return reversals). They also test the representative heuristic based on consistency of past performance and on confirming or disconfirming growth rates. They do find some support for medium-term underreaction but, overall, they conclude that either representativeness or conservatism is unlikely to cause market inefficiencies.

*2.3.2.2. Anchoring and Adjustment, Conservatism*

Edwards (1968) identified the phenomenon of conservatism, which states that individuals are slow to update their beliefs in the face of new evidence. In his experiments, Edwards benchmarked a subject's reaction to new information against that of a rational Bayesian in which the true value of a piece of evidence is well defined. What he found is that individuals update their posteriors in the right direction, but by too little in magnitude relative to the rational benchmark. The degree

of conservatism is also more pronounced the more useful is the new evidence. Edwards, in his own words, summarises:

*"It turns out that the opinion change in very orderly and usually proportional to numbers calculated from the Bayes Theorem – but it is insufficient in amount. A conventional first approximation to the data would say that it takes anywhere from two to five observations to do one observation's worth of work in inducing a subject to change his opinions." (p.359)*

Conservatism is also highly suggestive of the underreaction evidence presented above. Individuals subject to conservatism might disregard the full information content of some public announcement or an event only adjusting slowly, still tending to anchor to their prior estimates. This would be consistent with investors' tendency to underweight useful statistical evidence relative to their original less useful evidence. Another explanation might be that investors are overconfident about their prior information.

*2.3.2.3. Overconfidence*

In their summary of the microfoundations of behavioural finance, DeBondt and Thaler (1995) state, "perhaps the most robust finding in the psychology of judgement is that people are overconfident." It is a tendency to overestimate the exactness of one's knowledge. Applying this in the context of capital markets, investors overestimate the precision of their knowledge about the value of a financial security. They therefore overestimate the probability that their personal assessment of the value of a security is better than others (Barber and Odean, 2002). Thus, overconfident

investors believe more strongly in their own valuations and are not concerned much about the beliefs of other investors. Further, some evidence suggests that experts tend to be more overconfident than relatively less experienced individuals (Griffin and Tversky, 1992). Evidence also suggests that overconfidence is greatest for difficult and ambiguous tasks (Fischhoff, Slovic and Lichtenstein, 1977; Lichtenstein, Fischhoff and Phillips, 1982; Yates, 1990; Griffin and Tversky, 1992). A number of studies highlight the role of overconfidence among investors while making investment decisions, giving rise to several observed financial market anomalies. Barber and Odean (2000) provide evidence that households, which hold about half of U.S. equities, trade too much, on average. These findings, they say, are in line with the predictions of behavioural finance models, which incorporate investor overconfidence.[11] This is because they rely too much on their private information, causing them to trade too actively and, consequently, earn below-average returns. Barber and Odean (2001) test the "excessive trading" and "overconfidence" hypothesis by partitioning investors on gender. Psychological research demonstrates men are more overconfident than women. Barber and Odean's results reveal that the male investors in their sample tend to trade more aggressively than women investors and, as a result, earn lower returns. Finally, more recently, Barber and Odean (2002) examine the change in trading behaviour that takes place when investors go online. They find that, after going online, investors trade more actively, more speculatively, and less profitably than before. These findings are consistent with the theory that overconfidence leads to excessive trading and cannot be reconciled with rational behaviour.

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[11] See Daniel, Hirshleifer, and Subramanyam (1998, 2001), Odean (1998b) and Gervais and Odean (2000) for models based on overconfidence.

*2.3.2.4. Loss Aversion*

Loss aversion is the phenomenon that people tend to be averse even to very small risks relative to a reference point, suggesting a kink in the utility function (Hirshleifer, 2001, p.1545). This idea originates from the experimental work of Kahneman and Tversky (1979) most famously known as prospect theory. The idea behind prospect theory is that it is defined on gains and losses rather than on levels of wealth; their utility function is concave in the domain of gains and convex in the domain of losses. It is also steeper for losses than for gains, which implies that people are generally loss-averse (i.e. they are more sensitive to losses rather than gains).

*"Loss aversion is a crucial bias with major ramifications in all of our financial decision making. The psychological reasons for the strength of this bias are that such a loss is associated not just with regret and shame but also the feeling of responsibility and associated blame, all of which we inevitably seek to avoid." (Taffler, 2001, p.9).*

Odean (1998a) analyses the buying and selling behaviour of individual investors at a discount brokerage house in U.S. He finds that individuals hold on to losers while selling the winners too soon. Even after controlling for rebalancing and tax effects, the winning investments that investors choose to sell continue to outperform the losers they keep in subsequent months. The tendency to hold losers too long and sell winners too soon was also examined and labelled as the "disposition effect" by Shefrin and Statman (1985). This shows investors' unwillingness to accept loss in the hope of a turnaround and/or to avoid blame and regret. Kahneman and Tversky (1979) put this more eloquently:

*"A person who has not made peace with his losses is likely to accept gambles that would be unacceptable to him otherwise." (p.287)*

This phenomenon also might help us explain market underreaction being more pronounced to bad news. However it is essentially *a description* of investor behaviour, not really an explanatory theory of the reasons for such behaviour.

Having discussed some of the key cognitive biases drawn in behavioural finance we can see that they are not sufficient to specifically explain the phenomenon of market underreaction. For example, why do we sometimes observe underreaction to good news? Such heuristics and cognitive biases can only shed light on behavioural patterns in general and one can pick and choose a specific psychological bias and use it to explain a particular anomaly in a certain context ex post. Therefore, there is a need to look at more coherent explanations or develop formal, testable behavioural models, which can predict the anomalous market behaviour ex ante over time. The following section discusses some of the behavioural finance models influential in today's literature.

### *2.3.3. Theoretical behavioural finance models*

Work on behavioural finance has grown considerably in the last few years and now one can find various theoretical models built on the literature of the psychology of decision-making. However, as my primary concern is market underreaction, I only discuss models which seek to explain this market anomaly. Three recent models that produce patterns of under- and overreaction have been proposed. Barberis, Shleifer

and Vishny (1998) build a model of the behaviour of a representative investor based on the concepts of representativeness and conservatism discussed above. In their terminology, "representativeness" means that investors ignore the laws of probability and behave as if the events they have recently observed are typical of the return (or earnings) generating process. "Conservatism" means that investors are slow to update their prior beliefs in response to new information. These two behavioural tendencies and a particular model structure combine to produce underreaction in some circumstances and overreaction in others. For example, they say that underreaction will tend to occur in signals of low strength (size of signal) and high weight (importance of signal) and overreaction will tend to occur in signals of high strength and low weight. They also mention the idea of regime shifting between two possible states of nature namely mean reversion and trending. It is the former that causes underreaction and takes around 1-12 months of time for correction.

Daniel, Hershleifer and Subrahmanyan (1998) also rely on psychology for insights into the traits of a representative investor's decision-making process. In their model, investors are overconfident and exhibit biased self-attribution. "Overconfidence" means that investors believe too strongly in their own private information, which leads to systematic overreaction to private information and underreaction to public information. "Biased self-attribution" means that investors attach too much significance to signals that confirm their prior beliefs and too little significance to information signals that contradict them. Their model has somewhat different predictions to that of Barberis, Shleifer and Vishny (1998). Daniel, Hershleifer and Subrahmanyan's (1998) model uses the idea that investors overreact to their private information and adjust only slowly when the public signal contradicts it.

Underreaction is not caused by the signal itself but is only a consequence of initial overreaction and then rectification of initial mispricing. Conversely, if the signal confirms investors' beliefs, then overreaction will continue and the price will be further out of line with the rational value. In this setting, the drift following a public event/signal can be seen as either the continued overreaction or the subsequent reversal of the earlier mispricing.

Finally, Hong and Stein (1999) model the phenomena of underreaction and overreaction by focusing on a market composed of heterogeneous investors rather than relying on the psychological traits of representative agents. They identify two types of investors: "newswatchers (informed)" and "momentum traders (uninformed)." Both types of investors suffer from bounded rationality in that they can only process a subset of publicly available information but make maximum use of the information they do process. The limitations the authors place on the behaviour of these two classes of investors are that newswatchers rely only on the signals they observe privately and do not use current or past prices, while momentum traders, in contrast, do condition on past prices changes but only make simple forecasts. Finally, they make one further assumption that private information diffuses gradually across the newswatcher population. Their infinite-horizon model predicts that stock prices will underreact to information in the short run but will overreact in the long run. For example, when newswatchers are active, prices adjust slowly to new information causing an underreaction but never an overreaction. Similarly, when momentum traders are active they trade on the basis of past price changes generating momentum and causing prices to overshoot in the longer run, generally after one year, arbitraging away any underreaction left behind by the newswatchers.

### *2.3.4. Shortfalls of the extant models*

This section discusses theoretical shortcomings of the three behavioural finance models presented above. Recent empirical evidence is also reviewed to assess out-of-sample validity of these models.

#### *2.3.4.1. Theoretical critique*

In this section I comment on the theoretical underpinnings of these models and present the empirical evidence on their application in the following section. The above-mentioned models are called behavioural finance models in the finance literature today because they use psychological bits and pieces to put together a theory which is supposed to predict investor behaviour. However, the main thrust of these theoretical models remains mathematical in nature. Although each study seems to be motivated by behavioural concepts, they all differ in the predictions they make about the investor behaviour which causes medium-term underreaction. In the Daniel, Hershleifer and Subrahmanyan (1998) model, underreaction is a consequence of overreaction followed by return reversals. Conversely, in Barberis, Shleifer and Vishny (1998), underreaction stems from investors wrongly extrapolating past performance into the future and in Hong and Stein (1999) it results from gradual diffusion of private information among "newswatchers" because in the medium-term it is hypothesised that only they are active. In addition, as Shefrin (2000, p.102) points out, the key aspect of the differences in investor behaviour causing market underreaction in these three models is that the behavioural traits hypothesized in these papers have not been documented in psychological studies. It is essentially due to these reasons that these behavioural models have been viewed with scepticism to date.

Further, an important point to note is that these models present a very simplistic view of capital market structure and investor behaviour. These models either rely on two cognitive biases affecting investors or there are only two classes of investor. One can surely say that in real life scenarios there can never be two distinct classes of investor or only two biases affecting investor behaviour, as these models portray, but in fact the markets are composed of large numbers of very complex people having different values, beliefs, and preferences. Such simplification, i.e. abstraction completely from reality, may make the algebra tractable but then how meaningful can the models be?

*"Whenever economists have developed behavioural models the result has been bad economics and bad psychology." Shefrin (2000, p.102)*

Finally, the intuition behind these models reflects the authors being more worried about getting the economics right and not being much bothered about irrational investor behaviour which, in my opinion, should be the driving factor in psychological models. As these models are based on the economic principle of rational arbitrage, Lee (2001) calls them rational behavioural models. Should we be more worried about getting the economics or psychology "right" or uncovering the true phenomena which underlie investor behaviour so we can offer more plausible explanations of a particular anomaly, even if we have to accept the domain of "irrational" human behaviour?

*2.3.4.2. Empirical evidence*

Sadly, empirical evidence also does not validate the explanations provided by the above three models.[12] In fact, these models only address the anomalies they were designed to explain (Fama, 1998). For instance, these models predict that investors underreact to public information and/or information inconsistent with their prior beliefs and overreact to private information or past trends. Kadiyala and Rau (2004) point out that these models are not able to reconcile why investors seemingly overreact to a corporate event such as a seasoned equity offerings, while underreact to an event such as a share repurchase. Similarly, Fama (1998) argues that behavioural models cannot explain the long-run abnormal return evidence since the overreaction of investors to some events and underreaction to others implies that on average, investors are unbiased in their reaction to information. Additionally, more recent evidence suggests long-term return continuation[13] and also differential market reaction to good and bad news, which these models also do not take into account (see Table 2.1). *Hence, a key proposition of my thesis is that models, which do not distinguish between good and bad news, are incomplete.*

In particular, Kadiyala and Rau (2004) test the underreaction and overreaction hypotheses on a sample of all firms announcing stock-financed acquisitions, cash-financed acquisitions/tender offers, or open-market share repurchases from January 1980 to December 1994. They sort their samples on the basis of events conveying negative (seasoned equity offerings and stock-financed acquisitions) and positive (repurchases and cash-financed acquisitions) information. They then sort these two

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[12] See Fama (1998), Easterwood and Nutt (1999), Kadiyala and Rau (2004) and Chan, Frankel and Kothari (2004).

[13] Share repurchases (Ikenberry el al. (1995), stock splits (Ikenberry et al. (2002,1996) and dividends (Michaely et al. (1995).

groups further into two subgroups based on whether there was good news or bad news released prior to the event announcement. For instance, they use negative (positive) earnings surprise as a measure of bad (good) news prior to the event announcement. Although their results are sensitive to the methodology they use, generally their results are more consistent with the underreaction hypothesis. A key finding of their study is that the underperformance of the negative surprise sub-sample persists across the entire 36-month horizon, suggesting a more pronounced investor bias towards bad news. Importantly, however, their evidence finds no support for the overreaction hypothesis as well as the predictions made by the above-mentioned, more sophisticated models.

However, key criticisms of their study are that they neither define the event selection criteria they use nor mention why these events might portray good or bad news in the first place. They also do not attempt to explain the causes of market underreaction.

In another study Chan (2003) examines subsequent performance of portfolios using a one-month horizon strategy to distinguish between winner and loser firms. The portfolios are formed in the following month after the publication of news identified as either good (winner) or bad (loser) or no-news. He finds that the market underreacts mainly after bad news and this result is very robust. However, this underreaction is driven by smaller, probably illiquid firms making it difficult for sophisticated investors to arbitrage away this pattern. Chan also explores the overreaction model and finds weak results. Two issues arise from his paper which can be important in understanding the underreaction phenomenon. First, how liquid are stocks that usually underperform? And second, who is actually responsible for most of

the trading in such stocks? Studies which can provide empirical evidence on these issues are needed to advance our understanding of the circumstances where the market underreaction anomaly is most likely to be found. My PhD thesis also focuses on these issues.

### *2.3.5. Market underreaction and limits to arbitrage*

Rubinstein (2001) categorises market rationality into maximally rational, where all investors are rational, rational markets, where asset prices are set as if all investors are rational and finally, minimally rational. In this case markets are not rational; no abnormal profit opportunities exist for rational investors. The minimally rational capital markets paradigm suggests that it may be possible to find stock market anomalies but it is not possible to profit from these opportunities as there are significant limits to arbitrage in such situations. Recent empirical studies are reporting evidence consistent with this idea.

Lesmond, Schill and Zhou (2004) examine the profitability of momentum strategies. They identify that trading costs facing an arbitrageur not only include the bid-ask spread but a range of other costs like short sales costs, brokerage commissions etc. They find that in order to generate abnormal returns frequent trading in disproportionately high cost securities is required which prevents profitable strategy execution. In further analyses, they find that those stocks that generate large momentum returns are precisely those stocks with high trading costs. Based on this they conclude that abnormal returns associated with momentum investing are just illusory and once we adjust for these costs no profit opportunities exist. Similar results

are documented by Taffler, Lu and Kausar (2004) in the U.K. for their GCM-based trading strategy.

Chan, Frankel and Kothari (2004) argue that limits to arbitrage have become a somewhat necessary condition to test behavioural hypothesis because, they argue that unless arbitrage is limited rational investors will trade on these opportunities and pull prices back to economic fundamentals. They briefly mention that future research should explore contexts that *a priori* exhibit limited arbitrage and generally, small stocks exhibit characteristics of firms with limited arbitrage because they are less closely followed by analysts, they have lower institutional ownership, and higher trading costs, including higher bid-ask spreads (see, for e.g., Bushan, 1994). I seek to explore limits to arbitrage argument as an alternative explanation for the market underreaction phenomenon in my thesis.

### *2.3.6. Market underreaction, financial distress and bankruptcy regime*

The discussions in previous sections point out a very notable finding i.e., market underreaction is robust in bad news situations particularly when firms are in financial distress. In such situations the probability of bankruptcy is high and in the event of failure the final payout to the shareholders is usually dictated by the underlying bankruptcy regime in which the firm is operating. Examining the market underreaction anomaly to an unambiguous bad news signal (in the financial distress domain) also presents an ideal opportunity to extend such an investigation to institutional environments with divergent bankruptcy codes. Such an analysis will enable me to shed further light on whether or not investor behaviour is influenced by the underlying bankruptcy code of the institutional environment when responding to

bad news associated with increased financial distress. A perusal of the legal finance literature reveals a remarkable divergence across the bankruptcy codes of different countries with regard to the rights of claimholders in the event of a default on debt contracts, (e.g., see Franks et al., 1996; La Porta et al., 1997). Contrasts in legal regimes are important in explaining differences in how financial markets operate across countries (e.g., La Porta et al., 1997, 2002). Comparing the U.S. and U.K. institutional frameworks, legal scholars suggest that the U.S. is biased more towards the rights of debtors and thus preservation of the firm as a going-concern is a priority, whereas the U.K. is biased more towards the rights of creditors and thus premature liquidation is more likely (Franks et al., 1996). Once a firm enters bankruptcy proceedings in the U.K., it is unlikely that stockholders' equity has any residual value. Consequently, it is possible that a bad news event in the U.K., which signals increased default risk, will have a more negative market response than a similar signal in the U.S. Furthermore, various studies in the corporate governance area point out that the U.S. and U.K. have very similar capital market structures (i.e., large number of public firms, dispersed ownership, important role of institutional investors and managers holding significant equity stakes with high discretionary power etc.) and are classified as market-centered systems (see e.g., Allen and Gale, 2000). Hence, a U.S.-U.K. comparison provides a natural experiment to examine how a very similar information cue can have differential market impact because of differences in the underlying bankruptcy regimes. Important in this setting is the information cue or signal which has to be similar in nature in the two environments to make the comparison justifiable. This is discussed in Chapter 3. To have some idea of the two very different bankruptcy regimes i.e., of the U.S. and the U.K., I discuss the respective bankruptcy codes in the following sections.

*2.3.6.1. U.S. bankruptcy code*

Under its Chapter 11 provisions, the U.S. Bankruptcy Code allows a financially-distressed firm to seek court protection from its creditors from commencing or continuing to collect on their claims from the firm. Once a firm enters Chapter 11, an automatic 'stay' is invoked on the creditor which remains for the entirety of the bankruptcy proceedings, allowing the firm to reorganize and rehabilitate itself and emerge from bankruptcy as a healthy going-concern. The debtor firm maintains control of the assets and the day-to-day operations of the firm as *debtor-in-possession*. Chapter 11 is unique in the world in that it gives the debtor firm, and in many cases incumbent management, control over determining the structure of the reorganised firm (Kaiser, 1996). To the extent that incumbent management act in the interests of shareholders, they will maximise shareholder wealth and therefore the equity has some upside potential (White, 1989). In addition, Chapter 11 affords the debtor firm new opportunities for financing and limits the role of creditors in developing the reorganisation plan.

Since Chapter 11 is favourably biased towards debtors, critics of the U.S. bankruptcy code suggest that this results in wealth being transferred from creditors to shareholders when a firm enters Chapter 11. For instance, the doctrine of Absolute Priority (APR), whereby senior creditors are paid in full before any junior claimants retrieve their claims, is often violated (Franks and Torous, 1989; Eberhart et al., 1990; Weiss, 1990; Betker, 1995). These studies suggest that APR is only strictly enforced in 25% of the cases. In addition, managers of debtor firms in Chapter 11 have incentives to over-invest in new projects at the expense of shareholders (Gertner and

Scharfstein, 1991). This maintains the upside potential of equity with minimal downside loss. A classic example of this is the case of the Eastern Airlines bankruptcy. Weiss and Wruck (1998) show that the Chapter 11 court-sponsored asset stripping activities of the airline promoted the gambling of creditors' claims on new, high-risk investments. Finally, because Chapter 11 affords the debtor firm relatively greater decision control rights during bankruptcy proceedings, it promotes the continuance of firms as going-concerns when in fact they should be liquidated (i.e., the liquidation value of the firm is greater than the going-concern value) (Acharya et al., 2004).

*2.3.6.2. U.K. bankruptcy code.*[14]

Insolvency proceedings in the U.K. by and large involve compulsory or creditors' voluntary liquidation of the firm in a piecemeal fashion. Under Part I of the Insolvency Act of 1986, the incumbent management of a distressed firm surrenders control over the firm to a court-appointed "licensed insolvency practitioner", often a member of a public accounting firm.

Other than liquidation, distressed firms have access to four court-supervised proceedings: receivership, administrative receivership, administration and company voluntary arrangement. Under both receivership and administrative receivership, the main goal of the court-appointed receiver is to realise the assets of the firm quickly and efficiently and distribute the proceeds from the sale to creditors according to prior ranking interests.

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[14] Strictly speaking, the use of the term bankruptcy in the U.K. is restricted to individuals. However, I adopt U.S. nomenclature to describe the U.K. firm insolvency event.

Administration and company voluntary arrangement are the closest bankruptcy proceedings to Chapter 11 in the U.K. The intention of these procedures is to allow financially viable firms to restructure their obligations in order to rehabilitate themselves. Main differences between these U.K. proceedings and a Chapter 11 work-out include: (1) control over the reorganisation process is transferred from the incumbent management to a court-appointed administrator; (2) creditors play a large role in formulating the reorganisation plan; (3) there are no new financing opportunities to aid the firm in its restructuring process; and (4) there is no automatic stay provision or any other form of relief from creditors. Although both administration and company voluntary arrangement are more favourably biased towards the rehabilitation of the debtor firm than receivership or administrative receivership, these procedures are not often used by firms (approximately 2% of all insolvent firms that enter bankruptcy proceedings). This is because the interests of creditors remain a priority and thus managers often lose their jobs and equity holders are still unlikely to receive anything out of the procedures (Kaiser, 1996).

One charge against the creditor-biased bankruptcy code in the U.K. is that, unlike Chapter 11 in the U.S., there is no automatic stay provision which prevents a 'creditor race' (Brown, 1989; Aghion et al., 1994). Without this automatic stay, which provides temporary relief for the firm from its creditors, creditors have an incentive to clamour on top of each other to be the first in line to retrieve their claims as quickly as possible before other creditors can collect on their claims. This type of behaviour may initiate the premature liquidation of potentially economically viable firms (Acharya et al., 2004).

It is clear from the preceding discussion that the U.S. and U.K. bankruptcy codes assign differential decision control rights to creditors and debtors and differ on their preferential treatment of creditors and debtors. Differences in claimholder rights embedded in bankruptcy codes have a number of ex ante impacts on managers' corporate decisions. For instance, strict enforcement of creditor rights can enhance ex ante contractibility in debt contracts (Rajan and Zingales, 1995). In addition, if creditors are given priority over shareholders, then this should give management (acting on behalf of shareholders) incentives to avoid financial distress. The theoretical finance literature demonstrates the impact of bankruptcy codes on various corporate decisions (e.g., see White, 1994; Cornelli and Felli, 1997; Berkovitch and Israel, 1998; Bebchuk, 2002). More specifically, the recent study by Acharya et al. (2004) demonstrates that differences in the debtor-friendly U.S. and creditor-friendly U.K. bankruptcy codes can explain differences in the capital structures of firms between the two countries.

## 2.4. Key Findings of the Literature Review Section

The main points of the above literature review section as they relate to my thesis are:

- Investor overreaction finds little support in the empirical literature in accounting and finance.

- Investor underreaction is, however, a more robust phenomenon present across a range of events and has also stood up to a variety of robustness checks.

- Investor underreaction is more pronounced to bad news information releases i.e., asymmetric market response to the nature of the news (event/news disclosures).

- Empirical studies documenting market underreaction show that their results are most stable (economically and statistically) for firms in the high financial distress category, e.g., non-investment grade assets.

- Research within the traditional finance paradigm has not been able to provide a plausible explanation for causes of such anomalous market behaviour.

- Recent studies discuss liquidity problems, limits to arbitrage argument, and the issue of types of investors trading in stocks that underreact. However, no U.S. study tests these issues conditional on there being market underreaction.

- Behavioural finance, which draws on the psychology of decision-making, has been able to offer some general explanations suggesting that investors suffer from cognitive biases which potentially produce anomalous stock price patterns.

- Theoretical behavioural finance models, although analytical in nature, use behavioural biases to explain investor under- and overreaction but only offer a very naïve view of investor behaviour and are generally not supported by the growing empirical evidence.

- Differences in bankruptcy codes influence manager corporate decisions. Therefore, a clear gap is to study how stockholders respond to a clean bad news signal

which increases a firm's risk of failure i.e. taking the firm a step closer to bankruptcy in the two divergent institutional environments of the U.S. and the U.K..

The above key findings suggest the need to investigate this anomaly further and especially in the financial distress domain. There is also a need to study the longer-term return behaviour contingent on the nature of the news released by the event/disclosure. Therefore, it is important to select an event which can unambiguously be classified as good or bad and is comparable across the U.S. and the U.K. environments. The next chapter develops such a framework.

# CHAPTER 3

# RESEARCH FRAMEWORK, EVENT SELECTION CRITERIA, AND HYPOTHESES

## 3.1. Introduction

In the previous chapter I surveyed the relevant extant literature and summarised its key findings. In this chapter I develop my research framework which allows me to study the market underreaction anomaly comprehensively. The primary objective of this framework is to produce an event selection criteria which will enable me to select a clean and unambiguous good and bad news event and develop hypotheses to empirically test the market underreaction phenomenon conditional on the nature of the news (i.e., good or bad). The purpose is to see if the market is rational (unbiased) in its reaction to both good and bad news. Therefore, in order to select an event which could present stronger empirical evidence and further advance our understanding of the market underreaction anomaly the following criteria are suggested:

1. One key finding of the literature review suggests differential market reaction based on the nature of the event (good/bad) and has identified bad news as the key driver in the underreaction model. Therefore, one needs to select events where it is easy to distinguish between good and bad news to study unambiguously the market underreaction anomaly to good and bad news events.

2. Another key finding of my literature review section illustrates that the underreaction phenomenon is more robust in firms having a higher probability of financial distress. Firms in the financial distress domain have characteristics which clearly distinguish them in terms of extreme bad news and good news. As a result,

analysing events which are clean proxies of extreme firm financial distress can offer a very suitable test to examine market underreaction.

3. Information content released by the event itself i.e. can the event be *logically* labelled as good or bad in terms of shareholder wealth by analysing its impact on future cash flows?

4. Market-based approach i.e. the event (information release) is viewed as representing good or bad news on the basis of the market reaction to it, as reflected in its share price, and measured in terms of positive/negative post-event stock return being also consistent with criterion (3).

5. Investigating those events which would contribute something new to the existing empirical literature. This means that examining market reaction to new "clean" events/disclosures not previously studied, or to events where previous research findings have been ambiguous.

6. Finally, as comparing market reaction to bad news event in two different bankruptcy regimes is a significant part of my thesis, it is also important that this bad news event has a similar meaning in the U.S. and U.K. institutional environments selected as representing extremes of debtor-friendly and creditor-friendly bankruptcy codes.

The above-mentioned criteria help us to choose clean events, which do not present any ambiguity in their information content and subsequent market reaction. For

example, dividend omissions (previous research has used this as a proxy for financial distress) can be interpreted either way. Investors might, for instance, perceive dividend omissions as bad news but firm management might be taking such an action to be able to invest in a highly profitable investment opportunity having a positive impact on future cash flows. Similarly, bond downgrades is also not a very clean proxy for extreme financial distress as not all firms with bond downgrades can be considered as financially distressed. Additionally, not all publicly listed firms have corporate bonds especially smaller firms which by definition are more risky and have a higher tendency of failure.

On the basis of the above-mentioned criteria I have decided to use going-concern audit report disclosures, which in my opinion is the best and the cleanest measure of firm financial distress, to investigate the market underreaction phenomenon. Going-concern assumption is the basic principle that establishes the basis for the valuations and allocations used in accounting (Asare, 1990). The Statement on Auditing Standards (SAS) No. 59 – The Auditor's Consideration of an Entity's Ability to Continue as a Going-Concern (AICPA, 1988) stresses that the going-concern report is an important signal for financial statement users.

Going-concern audit disclosures relate to where auditors give their opinion on the medium-term (i.e. up to one year only) viability of the firm in their audit report. Auditors have the responsibility in every audit to assess their client's financial status and to modify their audit reports for uncertainties that may affect the company's ability to continue as a going-concern. An auditor's going-concern opinion in his/her audit report is of particular importance because, if need be, the auditor has the option

to modify the going-concern assumption, a basic principle underlying the preparation of financial statements. Therefore, the audit opinion is a key output of the accounting system. It is a mandatory, independent, and direct public-domain signal of firm financial distress. As part of the audit procedure for all publicly-listed firms, the auditor is required to assess the going-concern viability of the entity and communicate his/her assessment in the audit opinion which accompanies the financial statements. It thus constitutes a unique and an unambiguous extreme bad news event. Such a disclosure casts doubt over the ability of the firm to continue to operate in its present form in the medium-term, highlighting an increased risk of bankruptcy. Similarly, the opposite is true when such an opinion is lifted by the auditor (going-concern withdrawal) in a subsequent audit report. Therefore, I argue that going-concern opinions are unambiguous public-domain bad news signals offering a clean test for investigating the market underreaction anomaly conditional on the nature of the news. Specifically, a going-concern modified (GCM) audit report portrays clear bad news and when such a modification is lifted (GCM withdrawal) by the auditor, it represents good news.

Another very important dimension of my thesis is to investigate the market's reaction to a bad news signal in the financial distress domain conditional on the underlying bankruptcy regimes of the U.S. and the U.K. which the GCM opinion event appropriately fulfils. This is because a similar information cue, signalling an increase in default risk, in the two regimes can take on a different meaning essentially because of divergence in the bankruptcy codes, dictating final payouts in the event of bankruptcy. In the U.K., the going-concern auditing regime under SAS 600 (APB, 1993) and SAS 130 (APB, 1994) is based on and is very similar to SAS No. 58

(AICPA, 1988a) and SAS No. 50 (AICPA, 1988b) with equivalent auditing standards and procedures.

Based on the above discussion, it is reasonable to say that going-concern disclosures are the most appropriate events with which to examine the market underreaction anomaly conditional on the nature of the news (i.e., good or bad) as well as to investigate the impact of different bankruptcy regimes on the value of going-concern opinion to investors. In the next section, I review the literature on going-concern disclosures, mainly from a market reaction perspective.

### 3.2. Going-concern Audit Disclosures and Stock Returns

Previous market-based research examining the informational content of going-concern audit disclosures is rather divided. There are studies which support the notion that investors find value in these disclosures, while other studies do not. These inconclusive findings suggest severe methodological problems with all the extant research. Bailey (1982) points out that the key research design issue when examining the information content of the audit report is to control for contemporaneous information releases. He further suggests that the information content of most types of audit reports as investigated by security-price research methods used by these studies cannot contribute to our understanding of the issue of whether going-concern qualifications have information content because of potentially confounding concurrent information releases.

One of the earliest studies undertaken by Firth (1978) on U.K. data examines the issue of whether investors differentiate among the reasons for audit qualification. He

studies various types of audit qualification including going-concern disclosures. His sample consists of 247 qualified firms paired with unqualified firms. He essentially uses a control firm approach matched on the basis of year, industry, and size. On examining the daily stock returns of these firms for the 20-days surrounding the release of their published qualified annual reports he finds significant negative price adjustment for firms that received the going-concern, asset valuations, and adverse qualification. These results provide evidence that the going-concern audit disclosure has informational content.

Chow and Rice (1982) investigate whether qualified opinions convey adverse information as revealed in stock prices. Their sample includes 90 qualified and 90 matched unqualified firms also in financial distress (i.e. having similar characteristics as the qualified sample but without an audit qualification) on the basis of sales, industry and auditor type. They use the market model with an industry factor looking at firm specific stock returns for three months subsequent to the announcement period. Their study also explicitly controls for the impact of the earnings release around the time of the audit opinion. Their results indicate that firms having an unqualified opinion had a higher average three-month return than did the qualified opinion sample.

Banks and Kinney (1982) and Dodd, Holthausen and Leftwich (1986) further support the notion that uncertainty qualifications are associated with stock price declines and average abnormal returns. A more recent study by Carlson, Glezen and Benefield (1998) which controls for concurrent financial information disclosures using an

analysis of covariance (ANCOVA) approach, also suggests that investors find going-concern audit disclosures useful for firm valuation purposes.

Chen and Church (1996) and Holder-Webb and Wilkins (2000) are also indirectly supportive of the above argument. Chen and Church (1996) investigate the association between going-concern opinions and the market's reaction to bankruptcy filings. They find that firms receiving going-concern qualifications experience less negative excess returns in the period around bankruptcy filing than those firms receiving unqualified opinions. Overall, their results are consistent with going-concern opinions having informational value. Holder-Webb and Wilkins (2000) evaluate the expanded requirements of SAS No. 59 (AICPA, 1988), which requires auditors to actively evaluate and report on a client's going-concern status. Their results also show less negative price responses to bankruptcy announcements for firms receiving SAS No. 59 going-concern opinions than for firms receiving clean opinions under SAS No. 59.

More recently, two related specialised studies are those of Willenborg and McKeown (2001) and Weber and Willenborg (2003) who explore the case of going-concern audit opinions in micro-cap IPOs. In particular, Willenborg and McKeown (2001) find IPOs with a GCM audit report on the private-company financial statements contained in their prospectus significantly underperform those with non-going-concern audit reports by around 25% in the first year post-IPO and by three times that on a 3-year horizon. The authors attribute their results to the private information conveyed by the going-concern opinion helping uninformed investors better estimate IPO value in the secondary market. In a companion paper, Weber and Willenborg (2003) breakdown this analysis by type of audit firm and find that 1-year aftermarket performance is more negative for firms receiving going-concern opinions than those

with clean opinions for Big 6 and national firms but not for local firms. These findings suggest that auditor opinion does add value.

Finally, results from a study by Fields and Wilkins (1991) who examine market reaction to withdrawn "subject to" opinions lend weak support to the argument that withdrawn going-concern disclosures have information content. They use an event study framework to investigate common share price reactions to public announcements of withdrawn "subject to" opinions. They document a statistically significant positive average announcement period abnormal return. Furthermore, they show that withdrawals which are relatively less anticipated result in a stronger positive abnormal performance. These results suggest that withdrawn opinions in general are valuable to investors because they convey information which affects shareholder wealth. Jones (1996) investigates the market reaction to firms with going-concern opinions and to a sample of financially distressed firms receiving clean opinions. His results indicate negative mean abnormal returns for those firms which received going-concern opinions, while positive mean abnormal returns for financially distressed firms with clean opinions suggesting that the independent auditor's going-concern evaluation provides information to investors.

However, as stated earlier, not all capital market research detects a stock price reaction to a going-concern audit disclosure. Dodd, Dopuch, Holthausen and Leftwich (1984), employing a sample of 604 first year audit qualifications, examine the stock price reaction to these announcements. Their results, based on a small subset of going-concern opinion cases, suggest that there is little evidence of stock price reaction to going concern audit qualifications; a public domain disclosure. Similarly, results of no

association between stock price and going concern qualification disclosures have also been reported by Ball, Walker, and Whittred (1979), Davis (1982), Elliot (1982), and Levitan and Knoblett (1985).

Mutchler (1985), on the other hand, uses a statistical model to examine the relationship between the auditor's going-concern opinion and publicly available information. She finds that publicly available information can be used to predict an auditor's opinion, which implies that the going-concern opinion is redundant information and is thus unlikely to convey new information in the pricing of securities.

Craswell (1985) reviewing empirical research into qualified audit reports indicates that the differing results in several studies could relate to problems in research design. Similarly, Asare's (1990) review also points out several reasons for such conflicting results which are; a) announcement date uncertainty, b) event-study window horizon, and c) being unable to control for concurrent price sensitive information disclosures (Bailey, 1982). Citron, Taffler, and Uang (2004) also highlight the problems with using pair-matched samples and employ a different research design to overcome this problem. They also highlight the importance of controlling for investors' prior expectations when assessing the incremental information content of going-concern audit reports and therefore only study first-time audit report going-concern uncertainty disclosures.

To sum up, the above discussion of the market reaction studies examining the value-relevant information contained in the auditor's going-concern opinion reveals mixed

findings. Much of the early literature examining this research question documents little or no market reaction to the going-concern opinion. Whereas, recent studies examining the market's reaction to the release of the auditor's opinion show that the going-concern does have informational value to investors. However, non-market reaction studies demonstrate that it is possible to model or predict the opinion using publicly available data, thus rendering the usefulness of the audit opinion to investors, *per se*, to be minimal. Taken together, the going-concern opinion literature does not unambiguously suggest that the going-concern opinion provides new information to investors. In their survey of the disclosure literature, Healy and Palepu (2001) note the paucity of evidence on the value of the audit opinion to investors and welcome future research in this area.

## 3.3. Research Gaps

After reviewing the literature on market underreaction in the previous chapter and going-concern opinions above, it seems reasonable to say that going-concern audit disclosures provide us with an ideal opportunity to examine the market underreaction anomaly to extreme bad and good news events. As mentioned above, auditor's going-concern opinions are important accounting system disclosures. They are unambiguous, mandatory, independent and direct public-domain signals of firm financial distress. By exploiting the mandatory nature of this public information signal I provide a cleaner test of differential market reaction to good and bad news. This potentially overcomes the limitation of prior studies that face the issue of ambiguously attributing news signals to either good or bad and/or problems in clearly associating such signals to firm financial distress. Additionally, the going-concern audit opinion event offers a very suitable platform to study how the local bankruptcy

codes interact with this accounting information, indicating increased risk of loss, across the two jurisdictions of the U.S. and the U.K.

In the light of the literature discussed in this as well as in the preceding chapter, I explicitly state the motivations of and the research gaps that my thesis intends to fill as follows:

1. Going-concern modified (GCM) opinions offer the most appropriate and probably the cleanest test to study the market underreaction anomaly because the information conveyed by this message is unambiguously bad, highlighting an increase in distress risk, whereas, GCM withdrawals highlight improving firm conditions and thus constitute a clean good news signal. No other such equivalent signals are available in the literature.

2. No U.S. study has examined the phenomenon of market underreaction to GCM disclosures on a longer-term basis, although Taffler, Lu, and Kausar (2004) use a small sample to investigate this issue in the U.K. and find that the market underreacts on average to the tune of -24% to -31% over a one-year period. Studying this in the U.S. will provide further evidence on the robustness of this phenomenon internationally. Also the U.S. market is much larger and this is likely to increase the power of my tests.

3. No study has examined medium-term market reaction to comparative GCM withdrawal disclosures. This investigation will enable me to comment on investor reaction to a clean good news signal. Taken together with point 2

above, I will be able to provide important empirical evidence on the market underreaction phenomenon conditional on the nature of the news. The results will educate us regarding the market's ability to rationally impound public-domain good and bad news in this financial distress context with important implications for market pricing theory, behavioural finance and the accounting literature.

4. Conditional on finding market underreaction, I will investigate some of the reasons causing this phenomenon to persist over time. Particularly, I will investigate the limits to arbitrage arguments for my sample stocks to see if my results are consistent with Rubenstein's (2001) minimally rational markets paradigm. Additionally, I will discuss competing behavioural finance explanations for such a stock market behaviour. I will also examine trading patterns of different stockholder classes. This will enable me to provide empirical evidence on who is actually trading in these bad news stocks. Recent empirical evidence suggests that institutional investors have superior information-processing capabilities compared with retail investors. On the whole, such investigations are important to understand the circumstances surrounding the market underreaction anomaly and could potentially help us in identifying areas where one is most likely to find such stock market anomalies. Again, such evidence is lacking in the literature.

5. Last, but not least, no study has ever compared market response to going-concern modified audit opinions in the U.S. and the U.K. immediately around the announcement day and over a longer-time horizon (up to one-year). Such

an investigation is important in identifying the role of divergent bankruptcy regimes which could give different meanings to a similar information signal in the two institutional environments with implications for standard-setters, regulators and academics.

In summary, the going-concern opinion discussed above presents an ideal opportunity to explore the phenomenon of market underreaction, as it lies in the heart of the accounting system. These disclosures are in the financial distress domain, a domain of acute psychological stress where one can easily distinguish between extreme bad news and good news. Secondly, it also enables us to study investor response to this signal in the U.S. and the U.K. where the message is essentially the same but can take on different meanings because of differences in their respective bankruptcy codes.

The arguments presented in this chapter and in chapter 2 lead to the development of my hypotheses which are presented in the next section.

### 3.4. Testable Hypotheses

In this section I derive testable hypotheses that aim at addressing the gaps identified in section 3.3 above. Market behaviour, which we observe, is in fact based on how investors price equities in capital markets. Therefore, in essence, my research is aimed at drawing inferences about investor behaviour by investigating the market underreaction anomaly conditional on the nature of the news. More specifically, this study intends to provide direct evidence on how investors react to the accounts-based solvency position of the firm and whether going-concern modifications provide any additional price-sensitive information on such market behaviour. This study will

contribute to the existing literature on market efficiency by analysing the informational efficiency argument on the basis of the extent to which investors rationally incorporate new information while making investment decisions.

From the literature survey presented in Chapter 2 and above, three different stories emerge: one is what we observe empirically, second is the role of theoretical behavioural finance models and their suggestions about investor behaviour and the underreaction phenomenon, and the third is investor behaviour conditional on the underlying bankruptcy codes of the institutional environments. There seems to be some contradiction between the first two issues, that is, more recent empirical evidence on the market underreaction phenomenon is often inconsistent with the predictions of the extant behavioural finance models, which enables me to test the proposition "Does the market underreact to bad news and good news?" To explore this issue comprehensively and provide explanations I develop various testable hypotheses. Hypotheses 1 and 2 are generated directly from the empirical literature which highlights differential response to good and bad news. Hypotheses 3, 4, and 5 are developed from each of the three behavioural finance models discussed in section 2.3.3 of this thesis. To be meaningful these hypotheses are developed in line with the predictions of these models but stated as conventional null hypotheses of no abnormal market response. Hypotheses 7, 8, 9, 10, and 11 are designed to capture the role of other factors which could potentially explain the market underreaction phenomenon. Hypothesis 12 is formed to test for a limits to arbitrage explanation for the market underreaction anomaly and hypothesis 13 tests how different stockholders respond to bad news events by changing their holding patterns in such stocks over time. It is important to note that hypotheses 7 to 13 are conditional on first finding results which

demonstrate the existence of the underreaction phenomenon in my going-concern context i.e., with respect to hypotheses 1 and 2. Finally, hypotheses 14 and 15 test for differences in investor response to the publication of the going-concern modified opinions in the U.S. and the U.K. These hypotheses explore market responses to the GC signal, both in the short-term and longer-term, conditional on the bankruptcy code of the institutional environment.

Next, I describe the hypotheses to be tested.

### *3.4.1. Market reaction to bad and good news events*

The efficient market hypothesis [EMH] suggests that when markets are efficient stock prices always "fully reflect" all available information, (Fama, 1970). However, recent empirical evidence, reviewed in Chapter 2 above, uncovers certain events which have led to the EMH now being considered controversial. This evidence shows asymmetric market response, that is, market reaction to new negative information is slow and persists over time, whereas, the market responds in a timely manner to new, positive information. However, if investors rationally incorporate new pessimistic (optimistic) information while making their investment decisions then after controlling for risk, bad (good) news firms will not under (over) perform. I thus establish null hypotheses 1 and 2:

***H1: There is no difference in the performance of firms that receive GCM audit opinions (bad news) relative to an appropriate benchmark.***

***H2: There is no difference in the performance of firms that receive GCM withdrawal audit opinions (good news) relative to an appropriate benchmark.***

### *3.4.2. Testing the behavioural finance model of Barberis, Shleifer and Vishny (1998)*

Barberis, Shelifer and Vishny's (1998) (BSV) model predicts underreaction when the signal is of low strength (size of signal) and high weight (importance of signal). This framework is adopted by BSV from Griffin and Tversky (1992) who also tried to reconcile the bias of conservatism with that of representativeness. In Griffin and Tversky's framework, people are unimpressed by the low strength and react mildly to the evidence, even though its weight calls for a larger reaction. To illustrate these concepts, Griffin and Tversky use the example of a recommendation letter. The 'strength' of the letter refers to how positive and warm its content is; 'weight' on the other hand, measures the credibility and the stature of the letter writer. This concept can directly be applied to auditors issuing going-concern statements. A modified report will represent the strength of the auditor's statement while how credible the auditor is would be its weight. So, taking other factors into account, underreaction after a GCM could also possibly mean that investors do not perceive auditors as very credible. To develop a hypothesis to test BSV's model, I rely on one of the key assumptions behind their model that investors are expected to be in a mean-reverting regime, that is, they believe that future news shock will be in an opposite direction to the current one. But if they do not see what they expect then they are surprised and act on the news shock in the right direction but with conservatism. This leads to the development of the null hypothesis 3.

***H3: Irrespective of the nature of the news, sample firms with a positive (negative) shock prior to the event followed by another positive (negative) shock (on the announcement date) should not underreact to new information and no underperformance should be observed in the post announcement period.***

### *3.4.3. Testing the behavioural finance model of Daniel, Hirshleifer, and Subrahmanyam (1998)*

Daniel, Hirshleifer, and Subrahmanyam (1998) (DHS), in their behavioural finance model, make two propositions regarding the market reaction to non-selective events which I presume auditor going-concern disclosures are. The first predicts no systematic post-announcement drift following the event because it is not related to prior market mispricing as opposed to a selective event which would be. Their second proposition, which I use to generate the following hypothesis, intuitively means that investor underreaction only occurs if there is an opposition of signs between pre-event returns and the event itself. This is because of investors being overconfident about their private information, and when the subsequent public news contradicts this they do not react fully to the new information due to biased self-attribution. This leads to the development of null hypothesis 4.

***H4: If overconfident investors observe a non-selective event then firms with positive (negative) pre-event returns should not underreact to announcement period negative (positive) news and should not underperform in the post-event period.***

### *3.4.4. Testing the behavioural finance model of Hong and Stein (1999)*

Hong and Stein's (1999) key assumption is gradual diffusion of information among a specific class of investors which basically explains the underreaction effect in the medium term. However, this is a fairly general assumption. More important is to test their theory by developing a hypothesis based on the exact details of their models regarding how investors would behave if their model represented reality. Based on this premise I develop the following null hypothesis 5.

***H5: Even if private information diffuses gradually among newswatchers and sample firms exhibit underreaction prior to the event being released in the public domain then these firms should not underreact in the short-run after the announcement and momentum-traders should not be able to cause longer-run overreaction.***

### *3.4.5. Market underreaction and post-earnings announcement drift*

The publication of the audit report is usually accompanied by other concurrent news releases including accounting numbers. One of the most significant of these releases is the earnings release. It is well documented that extreme negative earnings changes are followed by abnormally low returns, an aspect of the post-earnings announcement drift (e.g. Ball and Brown, 1968; Bernard and Thomas 1989, 1990). Therefore, any underperformance of GCM firms may simply be due to the effect of correlated earnings changes. To explicitly control for any such potential post-earnings announcement drift I establish null hypotheses 6a and 6b:

***H6a: There is no difference in the subsequent returns of GCM firms with positive earnings change and negative earnings change.***

***H6b: There is no difference in the subsequent returns of GCM firms and non-GCM firms with similar earnings change.***

### *3.4.6. Market underreaction and firm size*

Dichev and Piotriski (2001) find that the underperformance to bond downgrades is more pronounced for small, low-credit-quality firms. To see if such an effect is present in my going-concern context I develop hypothesis 7:

***H7: There is no difference in the returns of GCM firms of small firm size and relatively large firm size.***

### *3.4.7. Market underreaction and distress risk*

Dichev (1998), in his study, finds that higher bankruptcy risk is not rewarded by higher returns. This means that highly distressed firms underperform less distressed ones, an idea inconsistent with risk-based explanations. Dichev (1998) then argues that the underperformance of these highly distressed firms is due to market mispricing since most distressed firms continue to earn below average returns for four years after portfolio formation indicating a slow and delayed market response to the available information. Griffin and Lemmon (2002) also find support for the mispricing argument presented by Dichev (1998) and present evidence that investors may have great difficulty in dealing with bad news especially among the highly distressed sample by not incorporating the pessimistic information conveyed by high O-scores in

their decision-making. If this is the case then, by controlling for distress risk, I should be able to explain part of the underreaction effect. I thus develop the null hypotheses 8a and 8b.

***H8a: There is no difference in the returns of less financially distressed GCM firms and highly financially distressed GCM firms.***

***H8b: There is no difference in the returns of GCM firms and non-GCM firms with similar financial distress levels.***

### *3.4.8. Market underreaction and price momentum*

Jegadeesh and Titman (1993, 2001) show that past trends in returns continue, that is, firms with low prior returns continue to underperform and firms with high prior returns continue to outperform. To test for such a momentum explanation I establish hypotheses 9a and 9b.

***H9a: There is no difference in the returns of low momentum GCM firms and high momentum GCM firms.***

***H9b: There is no difference in the returns of GCM firms and non-GCM firms with similar price momentum.***

### *3.4.9. Market underreaction and the penny stock bias*

By nature GCM firms are financially distressed, usually having low market capitalisation and associated low stock prices. Such stocks could well lead to return

measurement problems through trading frictions (large bid-ask spreads, poor liquidity etc). Conrad and Kaul (1993) and Ball, Kothari, and Shanken (1995) suggest apparent long-term market overreaction may be driven by computational problems associated with the returns on low price "loser" stocks. To see if the penny stock status is the cause of market underreaction in my GCM firm context I formulate hypothesis 10.

***H10: There is no difference in the returns of GCM firms and non-GCM firms with similar penny stock status.***

### *3.4.10. Market underreaction and industry specific explanation*

Conditional on finding abnormal performance for my GCM firms it would be reasonable to investigate whether or not any industry-specific effects drive such a performance. Womack (1996) used industry-adjusted returns as an additional return measurement benchmark to test the robustness of his post-recommendation drift. This leads to the development of hypotheses 11:

***H11: There is no difference in the returns of GCM firms and non-GCM firms operating in the same industry.***

### *3.4.11. Market underreaction and limits to arbitrage*

Rubinstein (2001) has put forward a new market paradigm which he terms minimally rational capital markets. This means that although the market is not rational, no abnormal profit opportunities exist for arbitrageurs. Recent empirical papers, for example, Lesmond, Schill and Zhou (2004) in the case of momentum profits and

Taffler, Lu, and Kausar (2004) for U.K. GCM firms, report results consistent with this idea. To test this issue for my U.S. GCM firms I establish hypothesis 12:

***H12: Arbitrageurs should not be able to profit from GCM firm underperformance after adjusting for transaction costs.***

### *3.4.12. Market underreaction and trading actvity*

Taffler, Lu, and Kausar (2004) find that institutional investors do not reduce their holdings in their GCM (bad news) stock over a period of one year following the publication of the audit report. Based on this they speculate that institutional investors also exhibit trading biases (behavioural) similar to retail investors (noise traders). However, studies investigating investor trading behaviour in the Finnish stock market suggest that sophisticated investors (mainly institutions) are less biased and their portfolios generally outperform the portfolios of unsophisticated investors (see Grinblatt and Keloharju, 2000, 2001a, 2001b). Bhattacharya (2001) and Bhattacharya, Black, Christensen, and Allee (2003) in the U.S. also find that large traders (institutions) are more informed and therefore more rational. To investigate this issue for my U.S. GCM firms I formulate null hypothesis 13:

***H13: There should be no difference in holding patterns of various stockholder classes in GCM (bad news) stocks over time.***

### *3.4.13. Market reaction to going-concern disclosures*

Auditors issue a going-concern opinion when they believe that there is substantial doubt regarding the entity's ability to continue as a going-concern for a period of time

not exceeding one year beyond the date of the financial statements being audited. In addition to negative trends in financial statement information, auditors should also consider non-publicly-available information such as management's plans to restructure operations, specific loan arrangements and covenant restrictions, and work stoppages, to mention but a few (SAS No. 59; AICPA, 1988b). To the extent that auditors consider non-publicly-available information in their going-concern assessment of the firm, and that this non-publicly-available information is not correlated with publicly available information, then the going-concern opinion may provide new information to investors. Hence, if market expectations of the auditor's going-concern opinion are adequately controlled for and the date of the opinion can be specifically identified, one would expect a negative market reaction to the unexpected component of the going-concern opinion at the time of its announcement in the U.S. and the U.K. This leads to null hypothesis 14:

***H14: There is no negative market reaction to the auditor's going-concern modified opinion at the time the opinion is announced.***

### *3.4.14. Market reaction to GCM disclosures conditional on the U.S. and the U.K. institutional environments*

Conditional on there being a negative capital market reaction, I examine whether the magnitude of this negative capital market reaction varies between the U.S. and the U.K. institutional settings. As previously discussed, the bankruptcy codes between the two countries vary in their preferential treatment of debtors and creditors. The U.S. bankruptcy code favours the interests of debtor firms at the expense of its creditors. Hence, it is likely that equity value is maintained when a firm enters

Chapter 11. Conversely, the U.K. bankruptcy code favours creditors at the expense of stockholders. It is likely that the value of equity is diminished significantly when a firm enters bankruptcy proceedings (usually liquidation).

Although the going-concern opinion has similar meanings in both the U.S. and in the U.K. (that is, there is substantial doubt that the firm will continue as a going-concern for a reasonable period of time), differences in how the U.S. and U.K. bankruptcy codes treat claimholders may impact how this signal is received by the equity-holders in these capital markets. The going-concern opinion signals an increase in the risk of bankruptcy for firms as shown in section 2.3.5 of chapter 2. Since there is little or no value left in the equity of firms entering bankruptcy in the U.K., compared to the U.S. where there is more likely to be preservation of equity value, the pessimistic information contained in the going-concern opinion may be viewed as more severe in the U.K. than in the U.S.[15] In addition, since auditors may wish to avoid the self-fulfilling prophecy of the going-concern opinion (that is, the issuance of the going-concern opinion may precipitate panic amongst creditors, suppliers, customers etc., who then withdraw support from the firm, thereby contributing to the overall demise of the firm, or accelerating its entrance into formal bankruptcy proceedings), they may be more reluctant to issue going-concern opinions unless the firm is clearly a bankruptcy candidate (see Citron and Taffler, 2001). Hence, because of the potential adverse consequences of this opinion, it is possible that the negative implication of this opinion is more severe in the U.K. than in the U.S. This leads to null hypothesis 15:

[15] In fact, it is very rare indeed for equity holders of U.K. public firms to receive anything at all after a firm enters into bankruptcy proceedings.

***H15: The negative market reaction to the auditor's going-concern modified opinion is no greater in the U.K. than in the U.S.***

## 3.5. Summary

In this chapter I developed a research framework which provided a rationale for selecting going-concern opinions as the most unambiguous and clean extreme bad and good news events for investigating the market underreaction anomaly. I then further developed testable hypotheses to empirically examine this anomaly and make an attempt to fill important gaps in the existing behavioural finance and accounting literature identified in chapter 2 and above. I first derive the hypotheses that test the market underreaction anomaly in the financial distress domain using going-concern audit report disclosures and then develop associated hypotheses to test whether explanations already documented in the literature explain this phenomenon. I also derive hypotheses to see if any potential arbitrage opportunities exist to exploit this anomaly and how holding patterns of different stockholders change around the publication of the GCM audit report. Finally, I develop hypotheses to test the impact of legal regimes on the market underreaction phenomenon in the U.S. and the U.K.

In the next chapter I describe the data and methodology that I use in order to formally test the hypotheses developed in this chapter.

# CHAPTER 4

# DATA AND METHODOLOGY

## 4.1. Introduction

In the previous chapter I laid out the hypotheses that are to be tested in this thesis. In this chapter I describe the data used and the methodology employed in order to test these hypotheses. Broadly speaking my thesis addresses two important issues in accounting and finance. First is the thorough examination of the market underreaction anomaly to acute bad and good news using U.S. firms that published their first-time going-concern modified audit reports from 01.01.1994 to 31.12.2002. Second, is the empirical investigation of whether there is any differential market response to first-time going-concern modified audit opinion firms in the U.S. and the U.K.. Here the impact of different legal regimes on the informativeness of accounting information is explored. To test the second issue, I use firms that publish their first-time going-concern modified audit report in the U.S. and the U.K. from 01.01.1995 to 31.12.2002. This sample period is used to maintain maximum homogeneity between the U.S. and the U.K., and commences at the start of the calendar year subsequent to the effective implementation date of the new U.K. going-concern auditing regime. Going-concern reporting behaviours differed significantly under the previous auditing guidelines (Citron, Taffler and Uang, 2004).

The chapter is organised as follows: section 2 describes the data used in this study, section 3 describes the methodology employed and section 4 summarises the chapter.

**TABLE 4.1**

## Sample Selection for Going-concern Market Reaction Analysis

This table shows how my population of 845 non-finance, non-utility industry firms listed on NYSE, AMEX or NASDAQ which published first-time going-concern modified audit reports (GCMs) between 01.01.1994 and 31.12.2002 is derived.

The sample is obtained by using Thompson Research's EDGAR free-text search facility. The main combination of keywords used for identifying my going concern cases is "raise substantial doubt" and "ability to continue as a going concern". Conditional on a firm having data in CRSP, each firm-year observation's actual audit opinion for the years t = -1, 0, 1, 2, where t = 0 is the GCM fiscal year, is then checked manually via SEC's EDGAR database. If a firm's previous year's audit report is not available on SEC's EDGAR database, Thompson Research's web search facility is used. If a firm's previous year could not be verified as non-GCM then that firm is dropped from further analysis. Firms receiving non-GCM opinions subsequent to their first-time going-concern modified audit opinion are used for GCM withdrawal analysis. For my entire sample the 10-K or 10-K/A filing date is the first date of publication of the audit report and hence is used as my event date. The only time I rely on the 10-K/A is if the audit opinion was amended with a going-concern modification added and reported in the subsequent 10-K/A filing. However, this only applies to less than 5% of my sample firms.

| | No. |
|---|---|
| Firm-year observations identified through EDGAR free text search | 14761 |
| Firm-year observations not found in CRSP | -9896 |
| Firm-year observations where previous year is not clean | -3026 |
| Firm-year observations with non-GCM opinions | -90 |
| Firm-year observations filing Chapter 11 before audit report publication date | -33 |
| Firm-year observations delisted before or in the GCM month | -663 |
| Firm-year observations classified as foreign | -38 |
| Firm-year observations classified as a development stage enterprise | -52 |
| Utilities and financial services firms | -103 |
| Firm-year observations suspended at the end of the GCM month | -11 |
| Firm-year observations with insufficient data in COMPUSTAT | -4 |
| Firm-year observations (sample size) for GCM market reaction analysis | 845 |
| | |
| Firm-year observations with clean opinions subsequent to modified audit opinion | 136 |
| Firm-year observations with no event-period stock return data in CRSP | -14 |
| Firm-year observations (sample size) for GCM withdrawal analysis | 122 |

## 4.2. Data, Sources and Sample Selection

In this section, I describe the data, its sources and the sample selection procedure for identifying first-time going-concern modified audit report firms in the U.S. and the U.K.

### *4.2.1. U.S. GCM firms*

Using a web-based application for refining COMPUSTAT's modified auditor opinion classification, Butler, Leone, and Willenborg (2004) find that from 1994 to 1999, 16% of modified opinions are in fact clean but coded incorrectly. To overcome this problem I use Thomson Financial's EDGAR free text search to identify firms with going-concern modified audit reports from 1994 to 2002. The main combination of keywords used is "raise substantial doubt" and "ability to continue as a going concern". This search essentially gives us 14,761 going-concern modified opinions published in 10-K filings. Table 4.1 summarises my sample construction.

I locate the searched companies on the CRSP database as investigating stock price performance is my primary objective. Of the 14,761 firm-years, 9,896 are not found in the CRSP database. I then search each company on the SEC's EDGAR database. From the remaining 4,865 firm-years, I further eliminate firms if their previous year is not clean or if they are financials, utilities, in a development stage, filed Chapter 11 prior to GCM publication date, are foreign or have insufficient data in CRSP/COMPUSTAT. My final U.S. sample consists of 845 non-finance, non-utility, industry firms with first-time going-concern modified (GCM) audit reports published between the beginning of 1994 and the end of 2002 with stocks listed on the NYSE, AMEX or NASDAQ. Companies in this sample that survive and have their going-

concern modified opinion withdrawn in the subsequent year, with sufficient data in CRSP/COMPUSTAT, are classified as my GCM withdrawal sample (the good news case). These 122 firms represent 15% of my initial GCM sample and around 30% of those surviving one year after a first-time GCM audit report.

In most cases, I use the actual 10-K filing date taken from EDGAR as the first formal announcement date of the going-concern opinion and this represents my event date.[16] Daily and monthly returns data, and market values are taken from the CRSP Database. All other financial data and z-scores, measuring bankruptcy risk (Altman, 1968), are computed using data drawn from COMPUSTAT analyst coverage from IBES. Institutional and insider holding data is collected from *Thomson Financial Network's* institutional holding and insider trading data files. U.S. bankruptcy data is from the SDC Bankruptcy database. Following Shumway (1997) and Shumway and Warther (1999), delisting returns are included in monthly returns. Monthly returns subsequent to delistings are represented by the equivalent monthly return on the S&P 600 Small Cap. Index as most of my GCM firms are small firms.

### *4.2.2. U.K. GCM firms*

My U.K. data covers the complete set of 127 non-finance industry firms with first-time GCM audit reports published between the beginning of 1995 and the end of 2002 with stocks fully listed on the London Stock Exchange or trading on the Unlisted Securities Market (USM).[17] USM market closed at the end of 1996 and only four of my 127 firms traded on USM. GCMs are identified by word search of the *KR On Disc*

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[16] Fewer than 5% of my U.S. GCM firms published their first-time GCM audit report in a 10-K/A filing. In such cases the 10-K/A filing date is used as the event date.

[17] There are only four utilities firms in my U.K. GCM sample. Utilities firms' characteristics do not differ as significantly in the U.K. in contrast to the U.S.

*UK Company Factfinder* monthly CDROM supplied by Dialog. The specific joint phrase searches used are 'going-concern' and 'our opinion not qualified'. Returns data is taken from the *London Share Price Database* (LSPD) and *Datastream*. Monthly natural logarithmic returns adjusted for capital changes and dividends are taken directly from LSPD and converted to monthly arithmetic returns, whereas daily data is taken from Datastream. Daily returns, adjusted for dividends, are defined as $R_{it} = (P_{it} + D_{it}) / (P_{it-1})$, where, $P_{it}$ = the closing price for firm i on day t, and $D_{it}$ = net dividend on the ex-dividend day t. For dead firms, the last trading month return is set to -100%. For acquired firms, subsequent monthly returns are represented by the equivalent monthly return on the FTSE Small Cap. Index. Financial data, and U.K.-based z-scores, measuring bankruptcy risk (Taffler, 1984), akin to Altman (1968) for the U.S., are computed using U.K. data drawn from the Thompson Financial *Company Analysis* database. Firm news is taken from the *Regulatory News Service* section of Reuters Business Briefings, Lexis-Nexis Executive and/or Factiva. Data on U.K. bankruptcies is compiled using a number of sources, namely, *The Financial Times* CGT Capital Losses publication, Thomson Financial, Lexis-Nexis Executive, Factiva and the *Regulatory News Service*.

In the U.K., management in effect has the choice of either disclosing the forthcoming GCM at the preliminary announcement of annual earnings stage or waiting until the annual report date (see Citron et al., 2004).[18] If the publication date of the audit report is the same as the annual report date, I use the date when this report is first available for inspection at the London Stock Exchange *Company Announcements Office* as the event date. Otherwise, the date of the preliminary announcement as provided by the

[18] In the U.K. the firm's preliminary announcement during the period under study contains most of the information published shortly after in the audited accounts (see Citron et al., 2004).

*Regulatory News Service* is used as the GCM event date. The use of U.K. GCM firm data is only restricted to Chapter 8, where my motive is to explore any differential market response to first-time going-concern modified audit opinion firms in the U.S. and the U.K. due to differences in the underlying bankruptcy regimes.

To minimise the influence of extreme outliers, observations for all the financial variables (excluding stock returns and market values) are set at the 1st and the 99th percentiles respectively.

## 4.3. Methodology

I discuss the methodologies used in my thesis in three separate sub-sections below. The first section describes the methodology of exploring the market underreaction anomaly in the longer-run. The second section outlines the methodologies to test whether going-concern modified audit reports have information content i.e. short-term study. The third part explains the methodologies employed a) to distinguish the good news (GC withdrawal) firms from the bad news (GCM firms) at the initial GCM stage and b) to test any differences in the informativeness of the GCM signal to investors in the U.S. and the U.K..

### *4.3.1. Methodology to test market underreaction-based hypotheses*

The main focus of my thesis is to explore the longer-run market reaction following the publication of GCM and GCM withdrawal audit reports in the U.S. and to see whether such price-relevant information is impounded fully by or around the information release date or takes time to be assimilated in market prices once it is fully in the public domain. Therefore, I collect monthly returns for 25 months, 12-months pre-

and 12-months post-annual report publication month. I term the annual report publication month as the announcement month (t=0) and exclude it from the analyses. If anything, this biases against finding abnormal returns as any initial market reaction to the GCM (GCM withdrawal) is ignored. The returns for both events (announcement of a GCM audit report and announcement of a GCM withdrawn audit report) are studied in parallel on an event-time basis. This means that my GCM withdrawal firms are rebased in event time according to their GCM withdrawn audit report publication date. I use the 10-K filing date taken from SEC's EDGAR database as the first formal announcement date of a going-concern opinion.[19]

For U.K. GCM firms, I collect monthly returns for 12-months post-annual report publication month. I term the annual report publication month as the announcement month (t=0) of the going-concern modified (GCM) audit report and exclude it from the analyses. As mentioned above, I use the annual report publication date or the preliminary announcement date, whichever is earlier, as my event date.

*4.3.1.1. Return generating methodology*

Two approaches have commonly been used in the literature for generating returns over variable time horizons, BHAR (buy-and-hold abnormal return) and CAR (cumulative abnormal return). However, there is some disagreement in the recent methodological studies on the best method. Barber and Lyon (1997) favour BHARs as it involves compounding returns and reflects actual investor experience. On the other hand, Fama (1998) argues for summing short-term abnormal returns and recommends CARs due to their desirable statistical properties which permit for cleaner tests of

[19] Textual search of press articles using Factiva provided only six cases of prior publication of news of forthcoming GCMs in my sample firms.

mispricing. I argue that if mispricing is strong then both the methods can be considered as complementary approaches for computing abnormal returns. Nonetheless, long-run abnormal return measurement problems using BHARs usually occur in a 3-5 year time horizon (Kothari and Warner, 1997, and Barber and Lyon, 1997), whereas, I restrict myself to a one-year time period only. As such, my main results employ the BHAR measurement metric; my CAR results are substantively identical to my main results and are presented in appendices to this thesis.

The return ($R_{it}$) on a buy-and-hold investment in sample firm i less the return on a buy-and-hold investment in an asset/portfolio with an appropriate expected return $E(R_{it})$ known as the buy-and-hold abnormal return (BHAR) is given by:

$$BHAR_{in} = \prod_{t=1}^{n}[1 + R_{it}] - \prod_{t=1}^{n}[1 + E(R_{it})] \qquad (1)$$

To further corroborate the BHAR methodology, I also report buy-and-hold raw returns (BHRRs) which can be viewed as a more stringent test of market mispricing and could also highlight mis-measurement problems associated with my benchmark. BHRRs are calculated as follows:

$$BHRR_{in} = \prod_{t=1}^{n}[1 + R_{it}] - 1 \qquad (2)$$

where $R_{it}$ is the return on a buy-and-hold investment in firm i in period t.

Due to the small average firm size of my sample, I only consider equally weighted returns as value-weighting could inflate standard errors and would result in low power

to detect abnormal performance (Loughran and Ritter, 2000). However, the effect of firm size for U.S. GCM firms is also considered in chapter 7 below.

Parametric t-tests and non-parametric sign, Wilcoxon rank-sum, and Mann-Whitney tests are employed to test the significance of (abnormal/raw) returns one-year before and one-year after the publication of the GCM and GCM withdrawal audit report. These tests are also applied when investigating the difference in longer-term abnormal returns between the U.S. and U.K. GCM firms.

*4.3.1.2. Performance evaluation*

To determine my expected returns, I primarily use a control firm approach (Barber and Lyon, 1997). However, for robustness purposes, I use two other models, namely, an extended three factor matched portfolio approach and the four-factor model. The two additional models are applied to the U.S. GCM firm analysis only and the associated results presented in the appendices. For the robustness of U.K. GCM firm results please refer to Taffler, Lu, and Kausar (2004).

*4.3.1.2.1. The control firm method*

Sample firms are matched to a control firm on the basis of specified firm characteristics. Barber and Lyon (1997) point out the control firm approach eliminates the new listing bias, the rebalancing bias, and the skewness problem. This is because the sample and the control firm must both be listed in the identified event month, sample and control firm returns are calculated without rebalancing and both the sample and control firm are equally likely to experience large positive returns. It also yields well-specified test statistics in virtually all the situations they consider. Ang and

Zhang (2004) additionally argue that the control firm method overcomes another important problem which is associated with the event firm not being near the centroid of the respective matched portfolio in the reference portfolio approach. This leads to the matched portfolio return not providing a good estimate of expected firm return. They also demonstrate this problem is more acute with small firms which my GCM population comprises. I identify a control firm by matching each of my GCM and GCM withdrawal firms with that non-financial, non-utility non-GCM firm which is most similar in size and book-to-market ratio.[20] More specifically, I first identify all firms with a market value of equity between 70% and 130% of the market value of equity of the sample firm at the end of the GCM (GCM withdrawal) month; from this set of firms I choose the firm with the book-to-market ratio closest to that of the sample firm. It is not possible additionally to control for momentum because of lack of observations, although I explicitly test for such effects for U.S. GCM firms in chapter 5.

*4.3.1.2.2. The three factor matched reference portfolio approach*

Reference portfolios are constructed from the *CRSP Database* returns files for all non-financial stocks fully listed on the NYSE, AMEX and NASDAQ. All firms having market capitalisation (month-end closing prices times shares outstanding) on *CRSP* and book value on *COMPUSTAT* are included. To ensure that accounting data are available, a six month lag is considered for all variables from COMPUSTAT used in portfolio formation. For example, a 31 December fiscal year-end firm will match COMPUSTAT data for 1994 with CRSP monthly returns from 1 July, 1995 through to 30 June,1996.

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[20] I include utilities firms' in my U.K. GCM firm analysis. Utilities firm characteristics do not differ as significantly in the U.K. in contrast to the U.S.

My benchmark portfolios are derived using three firm characteristics: size, book-to-market and momentum.[21] In line with Carhart (1997) I form 64 portfolios based upon four size groupings, four book-to-market groupings and four momentum groupings. Portfolios are formed each calendar month starting in January 1992 to December 2002, all portfolio firms are independently ranked on size (market capitalisation), book-to-market, and momentum into quartiles. The size quartile break-points are based on NYSE, AMEX and NASDAQ firms.[22]

To calculate the abnormal returns of my sample firms, I assign each sample firm to one of the 64 matched portfolios formed previously for the appropriate month. Using the market capitalisation, book-to-market ratio and momentum for the sample firm at the end of the GCM month, I compare these values to the break points for the matched portfolios of that period. The abnormal returns for each sample firm are then calculated by comparing the returns of the sample firm from the start of the calendar month after the GCM date with that of the matched portfolio on a monthly basis.

*4.3.1.2.3. The four-factor model*

The four-factor model that I use is the Fama-French three-factor model augmented by Carhart's (1997) momentum factor. The model is presented as follows:-

$$R_{it} - R_{ft} = a + b(R_{mt} - R_{ft}) + sSMB_t + hHML_t + uUMD_t + e_{it} \quad (3)$$

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[21] I augment the conventional size/book-to-market return benchmark (see Barber and Lyon, 1997, Table 3) with the Jegadeesh and Titman (1993) prior one-year momentum measure following Carhart (1997). Ang and Zhang (2004) demonstrate inclusion of beta as an additional factor to size and book-to-market provides little additional benefit.

[22] Using NYSE size breakpoints, test results are similar to those reported later.

where ($R_{mt}$-$R_{ft}$) is the market factor, constructed by subtracting the t-bill return from the value-weighted market returns. SMB (Small minus Big) is the size factor, constructed by taking the return on a portfolio of small stocks minus the return on a portfolio of big stocks. HML (High minus Low) is the book-to-market factor, formed by taking the return on a portfolio of value stocks (with high book-to-market ratios) and subtracting the return on a portfolio of growth stocks (with low book-to-market ratios). UMD (Up minus Down) is the average return on the two high prior return portfolios minus the average return on the two low prior return portfolios. $a_i$ is the intercept, $b_i$, $s_i$, $h_i$, $u_i$ are the coefficients and $e_i$ is the stochastic error term. $R_m$-$R_f$, SMB, HML, and UMD are obtained from Kenneth R. French's online data library on U.S. equity returns.

The application of the four-factor model that I consider is analogous to a traditional market model approach. This approach estimates four coefficients on the market risk premium, size factor, book-to-market factor and momentum factor using pre-event window returns. Expected returns are then calculated using these estimated coefficients for the post-event period. Post-event abnormal returns are calculated using a sample firm's realised return less the expected return. One drawback of this approach is that in order to obtain stable coefficient estimates it requires a minimum of 24-months contiguous pre-event returns. Many firms in my sample do not fulfil this requirement; therefore, I work with the reduced sample.

### *4.3.2. Methodology to test the information content of the GCM signal*

I use short-term windows to test for any abnormal returns around the publication of the GCM audit report. The return generating models for the short-term horizon is described below.

#### *4.3.2.1. Return generating model and short-term price reaction tests*

The market-adjusted model and outlier truncation is employed to measure abnormal returns (AR) for each security in this study calculated as follows:[23, 24]

$$AR_{it} = R_{it} - R_{mt} \qquad (4)$$

where:

$R_{it}$ = return for firm i on day t, and

$R_{mt}$ = return for the equivalent small cap. return Index on day t.[25]

To test null hypothesis H14 and provide initial evidence on H15, the cumulative abnormal return for firm i ($CAR_i$) is calculated by summing the daily abnormal returns ($AR_{it}$) over a two day period (t = -1,0), three day period (t = -1,1), and twelve day period (t = -1,10), where day 0 is the relevant GCM disclosure event date. Both parametric t-tests and non-parametric sign, Wilcoxon rank-sum and Mann-Whitney tests are employed to test for the difference in abnormal returns between U.S. and U.K. sample firms.

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[23] To determine the sensitivity of my results to model specification issues, I also conduct parallel analyses using winsorised market adjusted returns and with no outlier adjustment. Results are generally insensitive to model formulation so only the market-adjusted model truncated results are reported here.

[24] The use of the market-adjusted model is preferred as not leading to potential loss of cases through lack of sufficient pre-estimation period returns. Brown and Warner (1985) also show that the market-adjusted model is well-specified and the power of the tests is not enhanced by risk adjustment using OLS risk-adjusted market model estimates.

[25] I use the S&P 600 Small Cap. Index for U.S. firms while the equivalent FTSE Small Cap. Index is used for my U.K. sample. Small cap. indices are employed in preference to other more general indices because of the generally small market capitalisation of the firms in both my samples.

### *4.3.3. Multiple regression analysis*

Logistic and ordinary least-squares multivariate regression models are employed a) to distinguish the good news (GC withdrawal) firms from the bad news (GCM) firms at the initial GCM stage, and b) to test any differences in the informativeness of the GCM signal to investors in the U.S. debtor-friendly and the U.K. creditor-friendly regimes.

#### *4.3.3.1. Logistic regression model*

In order to see whether one can predict the GC withdrawal event using GCM firm characteristics I conduct a multivariate logistic regression test. My logistic regression model takes the following form with dependent variable $GCW_i$=1 if the GC audit report is withdrawn in next year's audit report for firm i, and 0 otherwise:

$$Pr\,(GCW_i = 1) = e^{z_i}/(1+e^{z_i}),\ where$$

$$z_i = \lambda_0 + \lambda_1 AR0_i + \lambda_2 ROA_i + \lambda_3 CR_i + \lambda_4 LEV_i + \lambda_5 DIVID_i + \lambda_6 Z\text{-}SCORE_i$$

$$+ \lambda_7 LN(SIZE)_i + \lambda_8 BM_i + \lambda_9 MOM_i + \lambda_{10} SUE_i + \lambda_{11} AUDITOR_i + u_i \qquad (5)$$

AR0 = GC month abnormal return is used as a market expectations variable. I expect withdrawal firms to have less negative reaction to the GC event. ROA = return on assets (net income/total assets) measuring any differences attributable to variation in operating performance of the two groups. CR = current ratio (current assets/current liabilities) is a proxy for liquidity. LEV = leverage proxy defined as total debt/total assets, DIVID = dividend paid dummy (1 if dividend paid, 0 if nominal or omission), and Z-SCORE = Altman's (1968) z-score, are all proxies for distress risk. LN(SIZE) = natural log of market value, measured by market capitalisation in $ million at the

end of the calendar month of audit report publication date, considers the effect of firm size. I expect higher market capitalisation firms to be less distressed and thus likely to have their GC subsequently withdrawn. BM, the book-to-market ratio, measured by book value of assets divided by market capitalisation at the end of the calendar month of audit report publication date, is used to account for future market expectations. Generally, I would expect lower values of BM to be associated with withdrawal cases. MOM = prior year returns (momentum) is derived as the monthly average of prior 11 months (t-12 to t-2) raw returns. I expect momentum to be positively related to the probability of withdrawal. SUE = standardised unexpected earnings for the last quarter of the fiscal year to which the going-concern opinion relates. I expect earnings expectations to be positively related to the GC withdrawal event. AUDITOR = audit quality proxy dummy (1 if Big5/Big6, 0 otherwise). $\lambda_0$ ....$\lambda_{11}$ are the regression parameter estimates and $u_i$ is a mean zero stochastic error term.

#### *4.3.3.2. Ordinary least-squares regression model*

Multiple ordinary least-squares regression analysis is used to test for any excess return differences between U.S. and U.K. GCM firms in the short- and longer-run, where short-term $CARs_i$ or longer-term $BHARs_i$ are the dependent variables for firm i. The ordinary least-squares multiple regression model used to test null hypothesis 15 relating to the differential market reaction at the date of first disclosure of the GCM in the two regimes is then given by:

$$CAR_i\ (BHAR_i) = \lambda_0 + \lambda_1 REGIME_i + \lambda_2 (PRTA)_i + \lambda_3 BM_i + \lambda_4 MOM_i + \lambda_5 PRCHEAR_i + \lambda_6 PREDGC_i + \lambda_7 DIVID_i + \lambda_8 PRZ_i + \lambda_9 LNCHPRZ_i + \lambda_{10} LNCHPRLEV_i + \lambda_{11} DELIST_i + \lambda_{12} BKT_i + \lambda_{13} AUD_i + u_i \quad (6)$$

The key variable of interest is the independent variable (denoted $REGIME_i$) which indicates the bankruptcy regime associated with GCM firm i. REGIME = 1 if the GCM firm is operating in the U.K. and = 0 if it is in the U.S. If the market reacts more adversely to the GCM event for a firm in the U.K., than in the U.S., I would expect the REGIME variable coefficient to have a significant negative sign if null hypothesis H15 is to be rejected at conventional levels. My methodology is designed to test whether REGIME captures the effect of institutional differences on security prices once the GCM audit report is released in the two environments. I suggest that if there is differential market reaction to the GCM event across the two countries then this is likely to be because of stark divergence in the respective bankruptcy regimes as opposed to other institutional differences which arguably are minimal in this financial distress setting (see section 2.3.5 above).

I control for factors that may explain the market's response to the GCM disclosures in the U.S. and the U.K. Since these GCM firms are likely to be in distress and thus experiencing severely depressed stock prices, I use population relative total assets (PRTA) as a proxy for firm size.[26] Results from Mutchler (1986) suggest that auditors will more often issue going-concern modifications to smaller firms. Additionally, Mutchler et al. (1997) suggest that it is quite possible that auditors are more confident that larger firms can weather financial difficulties or, as argued by Bell (1991), auditors may have greater concern about the bankruptcy of a larger company when this might have been at least partially caused by the going-concern modification itself.

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[26] I rerun my regressions using market value as a proxy for firm size. Results are qualitatively similar to those presented in chapter 8. Inclusion of both PRTA and market value in my regression model induces multicollinearity as the two variables are highly correlated. The correlation coefficient between PRTA and market value is 0.47 (p=0.000).

Thus, I expect, that the larger the company, the more negative the abnormal returns around the GCM announcement date. PRTA is derived by transforming the total assets figure for each of my GCM firms into a percentile based population relative number. PRTA ranges from 0 to 100, the larger the firm the higher the PRTA number. Another important variable which might explain cross-sectional abnormal return differences between the U.S. and U.K. is the book-to-market (BM) ratio. BM is used to account for any returns dissimilarities associated with lower (higher) expected future stock returns. Past evidence suggests that high book-to-market firms have higher returns, therefore, I expect the sign to be positive. Momentum (MOM) is used to control for price momentum prior to the issuance of the audit report.[27] Market expectations of GCM audit report issuance would be higher for firms with low (negative) momentum; therefore, the sign is expected to be negative.

Another important aspect to control for is earnings expectations. Bernard and Thomas (1989) document that extreme negative earnings surprises are followed by abnormally low stock returns. I proxy earnings expectation by population relative annual earnings change (PRCHEAR) in the one year leading up to the GCM announcement and expect the coefficient on this variable to be positive.[28] GCM firms with positive earnings surprise are expected to have higher stock returns and vice versa.

My next set of control variables relates to firm financial stress. I include a going-concern report expectation variable (PREDGC) in my regression model based on the multiple discriminant model used by Mutchler (1983) for U.S. GCM firms and a logit

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[27] MOM is defined as prior 11-month (t-12 to t-2) average raw return; t=0 is the GCM event month.
[28] PRCHEAR is calculated by transforming the annual change in earnings (CHEAR) calculated using model 1 of Foster, Olsen, and Shevlin (1984) into a percentile based population relative score ranging from 0 to 100. The lower the score the more negative the earnings change ratio.

model used by Citron and Taffler (2001) for U.K. firms. As the two models are very different, I let PREDGC be a dichotomous indicator variable.[29] I expect the sign of this variable to be positive, that is, less negative returns if GCM expected. In the case of dividend payment (DIVID) (= 1 if dividend paid; 0 if nominal/omission), which also controls for the market's expectation of the GCM announcement, I expect DIVID to be negative since the GCM conveys bad news (and is more surprising) for firms that previously paid dividends.

Population relative z-score (PRZ) proxy bankruptcy risk and I expect a positive relation between firm PRZ and stock returns in my GCM firm context.[30] This is because firms with higher PRZ are expected to be associated with a greater probability of a modified opinion (Mutchler et al., 1997). Therefore, market expectations for the issuance of a GCM audit report will also be higher for such firms. However, it is important to note that the PRZ variable is derived using financial statement information issued concurrently with the audit report and does not control for unexpected changes in the market's assessment of bankruptcy risk caused by changes in a firm's financial condition. Hence, I use natural log of change in population relative z-score (LNCHPRZ) to control for changes in bankruptcy risk.[31] I expect the coefficient on LNCHPRZ to be negative since a firm that becomes more financially distressed in the year leading up to the GCM announcement will experience more negative returns at the time of the GCM announcement. Similar to

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[29] Consistent with prior research (Fleak and Wilson (1994)), I use 0.01 as the cut-off for U.S. GCM firms. However, for U.K. firms, I split the sample into high/low expectations based on the median value derived from the logit model.

[30] PRZ is derived by transforming each GCM firm z-score into the respective U.S./U.K. population-relative z-score (PRZ) based on population z-score percentiles. Thus PRZ ranges from 0 to 1; the higher the score, the higher is the probability of bankruptcy. This is done to make the z-scores directly comparable across the two countries as Altman (1968) and Taffler (1984) have different z-score scales and cut-off points.

[31] I take the natural log of the change in PRZ ($1 + (PRZ_t - PRZ_{t-1}) / PRZ_{t-1}$), where t = GCM publication date) in order to control for the market's expectation of changes in distress risk.

LNCHPRZ, I also control for changes in the leverage of the firm in the year preceding the GCM announcement to control for default risk (LNCHPRLEV).[32]

Next, I use subsequent delistings and bankruptcies to measure the actual realisations of the market's expectations of bankruptcy risk. The two dummy variables which I use are a delisting dummy (DELIST equals 1 if a GCM firm is delisted due to performance reasons, 0 otherwise) and a bankruptcy dummy (BKT equals 1 if a GCM firm goes bankrupt, 0 otherwise). These ex post variables will clearly bring out any possible relation between stock returns and bankruptcy risk. I expect a negative relation between stock returns and bankruptcy risk and hypothesise that GCM firms that subsequently delist or go bankrupt in the one-year period after the publication of going-concern modified audit opinion, indicating higher levels of financial stress, would have lower (i.e., more negative) stock returns compared with GCM firms that neither delist nor go bankrupt.

Finally, AUDITOR is a dummy variable that equals 1 if the firm appointed a quality auditor (BIG5/BIG6) and 0 otherwise. Prior research (DeAngelo, 1981; Francis and Krishnan, 1999) suggests that BIG5/BIG6 auditors provide higher quality audits. Similarly, application of the Griffin and Tversky (1992) to the auditors report (see section 3.4.2 of my thesis) along with the existing evidence of higher quality audits might suggest that BIG5/BIG6 auditors are more credible. Thus, I speculate that as BIG5/BIG6 auditors are associated with quality audits, issuance of a GCM audit report will relatively be more timely and less expected as compared with non-big 5/6

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[32] This measure also proxies for debt covenant breaches which are not automatically disclosed in the U.K. Natural log of change in population relative leverage (LNCHPRLEV) is derived similar to LNCHPRZ but PRLEV (population relative leverage) ranges from 0 to 100. Higher score is associated with higher leverage.

auditors. Therefore, I expect the sign of AUDITOR variable to be negative. $\lambda 0$ ....$\lambda 13$ are the regression parameter estimates and $u_i$ is a mean zero stochastic error term.

## 4.4. Summary

Building on the literature review and the research framework outlined in chapters 2 and 3, chapter 3 then establishes the fifteen hypotheses my thesis sets out to test. This chapter outlines the methodology and data I employ. Four empirical studies are conducted to examine these hypotheses. My first empirical study seeks to investigate the market underreaction phenomenon to going-concern disclosures conditional on the nature of the news. This is presented in chapter 6. The second study tests the robustness of market underreaction to bad news for explanations already documented in the literature and is presented in chapter 7. In my third empirical investigation, I examine limits to arbitrage issues and stockholder trading patterns for my 845 U.S. going-concern modified audit report sample firms. This is presented in chapter 8. My final study explores the impact of different legal regimes on the informativeness of the information content of the going-concern modified audit report disclosures in the U.S. and the U.K. This research is reported in chapter 9.

# CHAPTER 5

# DIFFERENTIAL MARKET REACTION TO GOOD AND BAD NEWS

## 5.1. Introduction

In the previous chapter I described my data and outlined the methodologies to be used in my thesis. In this first empirical study, I test whether the market incorporates new (good or bad) information rationally or in a biased manner is a very important issue for market pricing theory. Existing empirical evidence shows that the market is delayed in its response to bad news events as opposed to good news events (see chapter 2). However, such events generally do not relate to extreme events such as financial distress and therefore it becomes difficult to cleanly classify them as either good or bad. Even those studies, which broadly are in the financial distress domain have a noisy proxy problem.

In this chapter, I test the key proposition of my thesis relating to whether the market underreacts to bad and/or good news events in the form of a going-concern modified audit report disclosure and its subsequent withdrawal? The auditor's going-concern opinion in his/her audit report is of particular importance because it is a mandatory, independent, and a direct public domain signal of firm financial distress. It thus constitutes a unique and an unambiguous extreme bad news event in the financial distress domain. Such a disclosure casts doubt over the ability of the firm to continue to operate in its present form in the medium-term, highlighting an increased risk of bankruptcy. Similarly, the opposite is true when such an opinion is lifted by the auditor (going-concern withdrawal) in a subsequent audit report. Using these two

contrasting events I am able to explore the differential market reaction to these important accounting releases conditional on the nature of the news.

Additionally, no study in the U.S. has explored this issue in the longer-run. Such an investigation would also enable me to comment on the information content of the going-concern audit report disclosure and whether such disclosures are valuable to the users of accounting information as my longer-term approach circumvents the methodological problems experienced by prior short-term market reaction studies.

The chapter is organised as follows: section 2 presents descriptive statistics of my U.S. GCM sample, and section 3 investigates the longer-term market reaction to first-time going-concern opinions. First, I present evidence on how the market anticipates changes in a firm's distress risk highlighted by the publication of a going-concern audit report opinion and then its subsequent withdrawal. Then, I investigate whether the market is rational in anticipating bad (good) news fully, or whether it underreacts (overreacts) to such news disclosure in the 12-month period after the GCM (GCM withdrawn) audit report release month (H1 and H2). Section 4 then explores whether the characteristics of the subset of GCM firms with their going-concern modified opinions lifted in their following year audit reports differ from the non-withdrawal cases, and section 5 explicitly tests the three behavioural finance models (H3, H4, and H5). Section 6 summarises the results of the chapter.

## 5.2. Descriptive Statistics of the U.S. GCM Sample

My data consist of 845 non-finance, non-utility, industry firms with first-time going-concern modified (GCM) audit reports published between the beginning of 1994 and

the end of 2002 with stocks fully listed on the NYSE, AMEX or NASDAQ. These companies have 62 different 2-digit SIC codes (231 different 3-digit SIC codes) indicating no significant degree of industry clustering. Returns data, market value, trading volume and bid-ask spread data are taken from the *Center for Research in Security Prices (CRSP) Database.* All other financial data are from *COMPUSTAT* and analyst coverage from IBES. Institutional and insider holding data is from *Thompson Financial Network's* institutional holding and insider trading data files. Z-scores, measuring bankruptcy risk (Altman (1968)), are computed using data drawn from COMPUSTAT. Following Shumway (1997) and Shumway and Warther (1999) delisting returns are included in monthly returns. To abstract from the influence of outliers, extreme observations for the book-to-market ratio and z-scores are set at the 1$^{st}$ and the 99$^{th}$ percentiles respectively. These percentiles are derived from population statistics and not from sample statistics.

Table 5.1 provides descriptive statistics. As can be seen from Panel A, not surprisingly, my firms which, by definition, are in financial distress, have low market capitalisation (mean size = \$34m) and are highly loss making (mean return on assets = –77%). Low current ratio (mean = 1.36) and high mean ratio of total interest bearing debt to total assets (38%) together with average z-score = –1.7, where z <1.8 means a high probability of failure, equally demonstrate the high risk profile of the firm sample. Average insider (board) holdings are 15% and mean institutional holdings are 12%. As might be expected analyst coverage is limited (mean (median) = 2 (1)) with 74% of firms for which IBES data are available followed by no analyst at all around the GCM date. However, the average firm trades on 236 days out of 252 trading days

in the year following the GCM month and mean annualised trading volume over the same period is 179%.

**TABLE 5.1**

**Data Summary Statistics**

This table presents summary statistics relating to my population of 845 non-finance, non-utility industry firms listed on NYSE, AMEX or NASDAQ receiving first-time going-concern modified audit reports between 01.01.1994 and 31.12.2002. Panel A reports continuous financial variables and Panel B other firm characteristics.

Panel A: Continuous financial variables

| Variable | Mean | Median | St. dev. |
|---|---|---|---|
| SIZE | 33.79 | 12.25 | 133.28 |
| SALES | 147.41 | 19.79 | 970.23 |
| TA | 176.18 | 24.15 | 1300.78 |
| ROA | -0.77 | -0.48 | 0.95 |
| Z-SCORE | -1.70 | -0.47 | 7.70 |
| CR | 1.36 | 0.95 | 1.42 |
| LEV | 0.38 | 0.32 | 0.38 |
| INSID | 0.15 | 0.10 | 0.15 |
| INSTIT | 0.12 | 0.07 | 0.13 |
| ANAL | 2.03 | 1.00 | 2.24 |
| PRICE | 1.92 | 1.12 | 4.65 |
| TRVOL | 179.28 | 86.05 | 291.80 |
| BIDASK | 10.7 | 8.5 | 9.2 |
| TRDAYS | 236 | 252 | 34 |

SIZE = market value measured by market capitalisation in $ million at the end of the calendar month of audit report publication date, SALES = sales in $ million, TA = total assets in $ million, ROA = return on assets (net income/total assets), Z-SCORE = financial distress z-score (Altman (1968)), CR = current ratio (current assets/current liabilities), LEV = leverage proxy defined as total debt/total assets, INSID = percentage of equity held by insiders at the end of the calendar month of annual report publication date, INSTIT = percentage of equity held by institutions at the end of the audit report publication quarter, ANAL = number of analysts providing earnings estimates in months t = -1, 0, 1, where t = 0 is the audit report publication month for firms in my population covered by IBES (n=142), PRICE = stock price in $ at the end of the calendar month of the audit report publication date, TRVOL = equity trading volume expressed as the number of shares traded in the year subsequent to the GCM month as a percentage of the number of shares in issue at the end of the GCM month. Where a firm is delisting trading activity to that date is annualised, BIDASK = month-end bid-ask spread as percentage of stock price averaged over the year following the GCM month for firms in my population with data available on CRSP (n=584), and TRDAYS = number of days on which trading takes place in the year (252 trading days) following the GCM month. Where the stock listing is suspended or cancelled the proportion of days on which the stock was traded prior to this date is annualised.

**Table 5.1 cont.**

Panel B: Other characteristics

| Variable | Number of positive cases | % of sample |
|---|---|---|
| EQUITY | 687 | 81.3 |
| EPS | 21 | 2.5 |
| DIVID | 213 | 25.2 |
| DEAD | 43 | 5.1 |
| DELIST | 332 | 39.3 |
| ACQU | 51 | 6.0 |
| AUDITOR | 637 | 75.4 |

EQUITY = book value of equity dummy (1 if positive, 0 otherwise), EPS = EPS dummy (1 if positive EPS, 0 otherwise), DIVID = dividend paid dummy (1 if dividend paid, 0 if nominal or omission), DEAD = bankruptcy dummy (1 if the firm enters into Chapter 7, Chapter 11, voluntary liquidation, or is wound up within one year of the audit report date, 0 otherwise), DELIST = delist dummy (1 if the firm is delisted due to any other reason within one year of the audit report date, 0 otherwise), ACQU = acquired dummy (1 if the firm is acquired within one year of the audit report date, 0 otherwise), and AUDITOR = audit quality proxy dummy (1 if Big5/Big6, 0 otherwise).

Panel B shows that fewer than 20% of my population have negative book value of equity. However, only 2.5% have positive earnings and just over 1 in 5 are paying dividends. Five percent enter into bankruptcy/liquidation (delisting codes: 400, 572, 574) within one year of the audit report date and a further 6% are acquired. Interestingly, an additional 39% of my sample is delisted due to performance reasons (delisting codes: 550 to 585). Dichev (1998) uses performance delistings as a broader measure of distress. Other than bankruptcy, performance delistings include insufficient capital or market-makers, price too low, delinquency in filing, failure to meet equity requirements etc. Seventy five percent of firms are audited by large audit firms (Big 5/Big 6).

## 5.3. Market Reaction to Going-concern Modified (bad news) and Going-concern Modified Withdrawn (good news) Audit Report Disclosures

In this section, I conduct formal tests on my null hypotheses 1 and 2 repeated from chapter 3 below. Fama (1998) points out that many long-term anomalies tend to

disappear with a reasonable change in abnormal return measurement techniques. I therefore employ various benchmark methods and return measurement metrics to check the robustness of my findings.[33]

***H1: There is no difference in the performance of firms that receive GCM audit opinions (bad news) relative to an appropriate benchmark.***

***H2: There is no difference in the performance of firms that receive GCM withdrawal audit opinions (good news) relative to an appropriate benchmark.***

The descriptive statistics presented in the previous section confirms the fact that these firms are going through a period of financial distress. To throw additional light on this issue I examine one-year pre-event returns for both bad and good news. I expect a decrease (increase) in stock prices prior to the publication of bad (good) news, as it would confirm the distressed (improved) state of the GCM (GCM withdrawal) firm. Table 5.2 presents prior 12-month mean and median BHRR and BHAR results. As can be seen, first-time GCM firms exhibit large stock price declines in the one-year period prior to the release of this bad news into the public domain. In contrast, the subset of GCM withdrawal firms experiences a large stock price increase in the equivalent one-year period leading up to the publication of their subsequent non-GCM audit reports. Panel A shows the mean (median) BHRR results for the 12-month prior period for my GCM and GCM withdrawal samples to be -50% (-64%) and 102% (22%) respectively. All results are significant at conventional levels. A similar story is reflected in the more reliable BHAR results, which are adjusted for risk, presented in

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[33] GCM post-event results computed using cumulative abnormal returns, matched reference portfolio approach and the four factor model are substantively similar to my main results and are presented in appendices 1, 2 and 3.

panel B of the same table with mean (median) 12-month prior period BHARs for GCM and GCM withdrawal firms of -58% (-48%) and 71% (34%). The substantial decline in the value of these firms leading up to their first-time going-concern opinion confirms the fact that they are going through a period of increased financial distress (bad news). On the other hand, following the abnormal stock price rise, GCM withdrawals, on average, can clearly be associated with good news. These results are consistent with the market anticipating both bad and good news in this financial distress context.

**TABLE 5.2**

**First Time Firm Going-concern Modified and Going-concern Modified Withdrawal Audit Report Rre-announcement 12-month Buy-and-hold Returns**

This table presents buy-and-hold raw (abnormal) returns (BHRRs and BHARs) for my population of 845 (122) non-finance, non-utility industry firms listed on the NYSE, AMEX or NASDAQ which published a going-concern modified audit report (GCM) (going-concern modified withdrawn audit report) for the first time between 01.01.1994 and 31.12.2002. The 12-month period reported commences in the 12th month prior to the respective going-concern opinion audit report release month. Panel A provides mean and median BHRRs and panel B provides the equivalent BHAR results using a control firm benchmark.

Each GCM (GCM withdrawal) firm in my population is matched with that non-finance, non-utility industry non-GCM firm with most similar size and book-to-market ratios. Specifically, all non-financial, non-utility firms without GCM audit reports listed on the NYSE, AMEX or NASDAQ are first identified with a market value of equity between 70% and 130% of that of the sample firm. The control firm is then selected as that firm with book-to-market ratio closest to that of the sample firm.

**Panel A: Buy-and-hold raw returns**

| Months in event time | -12 | -11 | -10 | -9 | -8 | -7 | -6 | -5 | -4 | -3 | -2 | -1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *GCM firms (n=845)* | | | | | | | | | | | | |
| Mean BHRR | -0.03 | -0.07 | -0.10 | -0.14 | -0.22 | -0.28 | -0.33 | -0.39 | -0.44 | -0.44 | -0.47 | -0.50 |
| t-value | -3.57 | -6.01 | -6.71 | -5.69 | -12.41 | -17.66 | -22.86 | -26.23 | -28.00 | -24.16 | -27.27 | -28.46 |
| Median BHRR | -0.06 | -0.11 | -0.15 | -0.20 | -0.28 | -0.37 | -0.41 | -0.49 | -0.54 | -0.56 | -0.60 | -0.64 |
| Wilcoxon z-value | -6.34 | -8.81 | -10.61 | -13.25 | -15.78 | -17.66 | -19.13 | -20.42 | -20.76 | -20.64 | -21.30 | -21.35 |
| Sign z-value | -7.73 | -9.33 | -11.24 | -13.17 | -15.79 | -18.51 | -19.36 | -20.73 | -21.51 | -21.46 | -22.40 | -23.22 |
| | | | | | | | | | | | | |
| *GCM withdrawal firms (n=122)* | | | | | | | | | | | | |
| Mean BHRR | 0.04 | 0.11 | 0.21 | 0.25 | 0.31 | 0.29 | 0.41 | 0.43 | 0.53 | 0.62 | 0.78 | 1.02 |
| t-value | 1.13 | 1.88 | 3.13 | 3.63 | 3.76 | 3.44 | 3.77 | 4.11 | 4.51 | 4.45 | 4.81 | 4.85 |
| Median BHRR | -0.04 | -0.03 | 0.06 | 0.01 | 0.00 | 0.02 | 0.09 | 0.05 | 0.08 | 0.16 | 0.26 | 0.22 |
| Wilcoxon z-value | -0.80 | -0.34 | 2.06 | 2.19 | 2.45 | 1.81 | 2.65 | 2.41 | 2.71 | 3.04 | 3.96 | 3.83 |
| Sign z-value | -1.97 | -0.37 | 1.27 | 0.36 | 0.09 | 0.09 | 1.36 | 1.00 | 0.82 | 1.54 | 1.90 | 1.90 |

**Table 5.2 cont.**

Panel B: Buy-and-hold returns derived using a control firm benchmark

| Months in event time | -12 | -11 | -10 | -9 | -8 | -7 | -6 | -5 | -4 | -3 | -2 | -1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *GCM firms (n=845)* | | | | | | | | | | | | |
| Mean BHAR | -0.02 | -0.07 | -0.11 | -0.15 | -0.23 | -0.26 | -0.32 | -0.38 | -0.44 | -0.48 | -0.53 | -0.58 |
| t-value | -1.82 | -4.48 | -5.82 | -5.87 | -9.99 | -11.24 | -12.82 | -14.49 | -13.92 | -13.49 | -13.27 | -15.01 |
| Median BHAR | -0.03 | -0.07 | -0.13 | -0.15 | -0.21 | -0.23 | -0.28 | -0.34 | -0.38 | -0.40 | -0.41 | -0.48 |
| Wilcoxon z-value | -2.52 | -5.50 | -7.29 | -9.00 | -10.83 | -11.82 | -12.82 | -14.70 | -14.94 | -15.60 | -16.33 | -17.12 |
| Sign z-value | -3.01 | -5.32 | -6.73 | -8.07 | -10.07 | -10.81 | -12.27 | -13.17 | -13.33 | -13.98 | -15.26 | -15.95 |
| | | | | | | | | | | | | |
| *GCM withdrawal firms (n=122)* | | | | | | | | | | | | |
| Mean BHAR | 0.03 | 0.11 | 0.19 | 0.18 | 0.19 | 0.17 | 0.30 | 0.35 | 0.30 | 0.46 | 0.49 | 0.71 |
| t-value | 0.65 | 1.69 | 2.56 | 2.24 | 1.75 | 1.43 | 2.08 | 2.34 | 1.50 | 2.61 | 2.37 | 3.06 |
| Median BHAR | -0.02 | 0.04 | 0.10 | 0.09 | 0.13 | 0.11 | 0.21 | 0.21 | 0.20 | 0.23 | 0.31 | 0.34 |
| Wilcoxon z-value | -0.08 | 0.43 | 1.99 | 1.67 | 2.29 | 1.97 | 2.95 | 3.07 | 3.17 | 3.05 | 3.36 | 3.25 |
| Sign z-value | -0.55 | 0.00 | 1.64 | 1.09 | 2.44 | 1.00 | 2.26 | 2.08 | 2.81 | 2.81 | 2.63 | 2.99 |

**TABLE 5.3**

**First Time Firm Going-concern Modified and Going-concern Modified Withdrawn Audit Report Post-announcement Month Buy-and-hold Returns**

This table presents buy-and-hold raw (abnormal) returns (BHRRs and BHARs) for my population of 845 (122) non-finance, non-utility industry firms listed on the NYSE, AMEX or NASDAQ which published a going-concern modified audit report (GCM) (going-concern modified withdrawn audit report) for the first time between 01.01.1994 and 31.12.2002. The 12-month period reported commences on the first day of the month immediately following the going-concern opinion audit report release month. Returns earned by delisted firms are represented by the equivalent monthly return on the S&P 600 Small Cap. Index. Panel A provides mean and median BHRRs and panel B the equivalent BHARs results using a control firm benchmark.

Each GCM (GCM withdrawal) firm in my population is matched with that non-finance, non-utility, non-GCM firm with most similar size and book-to-market ratios. Specifically, all non-financial, non-utility firms without GCM audit reports fully listed on the NYSE, AMEX or NASDAQ are first identified with a market value of equity between 70% and 130% of that of the sample firm. The control firm is then selected as that firm with book-to-market ratio closest to that of the sample firm.

**Panel A: Buy-and-hold raw returns**

| Months in event time | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *GCM firms (n=845)* | | | | | | | | | | | | |
| Mean BHRR | -0.01 | -0.04 | -0.08 | -0.10 | -0.14 | -0.15 | -0.16 | -0.15 | -0.11 | -0.09 | -0.05 | -0.03 |
| t-value | -0.38 | -2.05 | -3.34 | -3.95 | -5.35 | -5.77 | -5.77 | -5.17 | -3.22 | -2.30 | -1.02 | -0.67 |
| Median BHRR | -0.08 | -0.13 | -0.19 | -0.24 | -0.32 | -0.33 | -0.36 | -0.38 | -0.37 | -0.35 | -0.38 | -0.40 |
| Wilcoxon z-value | -4.57 | -6.46 | -8.71 | -9.92 | -10.68 | -11.59 | -11.33 | -11.13 | -10.37 | -10.06 | -9.94 | -10.09 |
| Sign z-value | -7.02 | -8.38 | -10.29 | -11.12 | -12.15 | -13.11 | -12.49 | -12.11 | -11.42 | -12.04 | -11.63 | -11.90 |
| | | | | | | | | | | | | |
| *GCM withdrawal firms (n=122)* | | | | | | | | | | | | |
| Mean BHRR | 0.03 | 0.02 | 0.04 | 0.00 | -0.03 | -0.05 | -0.04 | 0.02 | -0.02 | 0.05 | 0.09 | 0.25 |
| t-value | 0.75 | 0.37 | 0.61 | 0.07 | -0.37 | -0.87 | -0.57 | 0.20 | -0.24 | 0.56 | 0.79 | 1.44 |
| Median BHRR | -0.05 | -0.10 | -0.12 | -0.12 | -0.17 | -0.20 | -0.21 | -0.19 | -0.23 | -0.21 | -0.22 | -0.20 |
| Wilcoxon z-value | -1.55 | -2.52 | -2.01 | -2.17 | -2.52 | -2.66 | -2.76 | -2.14 | -2.00 | -2.04 | -2.24 | -1.82 |
| Sign z-value | -2.59 | -3.17 | -2.99 | -3.17 | -3.71 | -3.17 | -2.99 | -3.89 | -2.81 | -3.53 | -3.17 | -2.26 |

**Table 5.3 cont.**

Panel B: Buy-and-hold returns derived using a control firm benchmark

| Months in event time | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *GCM firms (n=845)* | | | | | | | | | | | | |
| Mean BHAR | -0.03 | -0.05 | -0.08 | -0.09 | -0.13 | -0.13 | -0.13 | -0.15 | -0.13 | -0.21 | -0.17 | -0.16 |
| t-value | -1.69 | -2.28 | -2.79 | -2.76 | -3.50 | -3.68 | -3.54 | -3.62 | -2.91 | -3.70 | -2.81 | -2.59 |
| Median BHAR | -0.05 | -0.06 | -0.10 | -0.13 | -0.13 | -0.16 | -0.17 | -0.18 | -0.16 | -0.16 | -0.16 | -0.17 |
| Wilcoxon z-value | -3.40 | -4.04 | -4.85 | -4.87 | -4.94 | -5.40 | -5.14 | -5.34 | -5.08 | -5.14 | -4.97 | -4.97 |
| Sign z-value | -4.45 | -3.99 | -4.40 | -5.02 | -4.88 | -6.05 | -5.85 | -5.85 | -5.64 | -4.33 | -4.61 | -4.68 |
| | | | | | | | | | | | | |
| *GCM withdrawal firms (n=122)* | | | | | | | | | | | | |
| Mean BHAR | 0.07 | 0.04 | 0.00 | -0.07 | -0.07 | -0.04 | 0.01 | 0.08 | 0.04 | 0.11 | 0.14 | 0.28 |
| t-value | 1.44 | 0.62 | 0.01 | -0.67 | -0.67 | -0.47 | 0.06 | 0.85 | 0.37 | 0.97 | 1.16 | 1.62 |
| Median BHAR | -0.01 | -0.04 | 0.01 | -0.01 | -0.02 | 0.00 | 0.01 | 0.07 | 0.00 | 0.00 | -0.01 | 0.06 |
| Wilcoxon z-value | -0.64 | -0.38 | 0.09 | -0.02 | -0.46 | 0.15 | 0.27 | 0.40 | 0.12 | -0.17 | -0.25 | 0.58 |
| Sign z-value | -0.36 | -1.00 | 0.09 | -0.81 | -0.27 | 0.27 | 0.27 | 1.18 | 0.00 | -0.09 | -0.45 | 0.81 |

I next explore if this market anticipation of bad and good news is complete, or whether the market underreacts (overreacts) to first-time GCM (withdrawn GCM) audit report disclosures, resulting in a subsequent downward (upward) drift, implying incomplete market reaction to the respective news events. Panel A of table 5.3 provides the mean and median post-going-concern opinion announcement month BHRRs over the following 12-month period. As can be seen, results are consistent. Twelve-month (6-month) mean BHRRs following the GCM and GCM withdrawn audit opinions are -3% (-15%) and 25% (-5%). Equivalent median results are -33% (-40%) and -20% (-20%). All the results for my GCM sample (bad news) are significant at better than 1% levels, save the 12-month mean results.[34] Whereas, neither mean result is significant for my GCM withdrawal sample (good news). However, the median results are both significant at better than the 10% level. As such, the results for the GCM withdrawal sample are difficult to interpret on this raw return basis.

Buy-and-hold abnormal returns, presented in panel B of the same table, portray a similar story to my GCM results in the bad news case. Twelve-month mean (median) results are -16% (-17%), significant at conventional levels.[35] However, when I risk adjust my GCM withdrawal firms using control firm BHARs, none of the mean or median results are distinguishable from zero; there is no evidence of any market mispricing over the following 12 months or for any sub-period after the withdrawn

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[34] Market 12-month (6-month) BHRRs on the equivalent market index-based portfolio (employing the S&P 600 Small Cap. Index) are 8% (-0.5%) with median results 11% (2%); only the 12-month results are significant. However, the 12-month trend shows that the market, on average, is rising during my study period and it is hard to imagine any asset pricing model suggesting negative returns in up markets.

[35] An alternative treatment to reinvesting the notional proceeds from selling delisted stocks in the market index is to use the monthly returns of the continuing listed GCM firm sample. Twelve-month mean (median) BHARs on this basis are unaffected.

GCM audit report. These results may not be surprising given these returns are conditional on the firms in question surviving for a full year post-GCM. Nonetheless, the above results highlight two key findings. First, there are no significant abnormal returns following GCM withdrawals (the good news case). Second, first-time GCM audit report disclosures (the bad news case) are followed by substantial negative abnormal returns; market reaction to bad news is incomplete and this drift persists for up to one year after the audit report announcement.

Figures 5.1 and figure 5.2 graph the mean buy-and-hold abnormal returns over the 25 months pre- and post-going-concern opinion announcement events for both my GCM (bad news) and GCM withdrawal (good news) firms separately, for illustrative purposes. Figure 5.1 highlights incomplete market anticipation of bad news, resulting in a post-event announcement month drift, whereas, figure 5.2 demonstrates that the market anticipates good news fully with no significant market reaction following the good news announcement month.

**FIGURE 5.1**

**Twelve Month Pre and Post-going-concern Modified Audit Report Announcement Mean Buy-And-Hold Abnormal Returns**

This figure graphs the mean buy-and-hold abnormal returns (BHARs) for 12 months before and 12 months after the publication of a first-time going-concern modified audit report for my population of 845 non-finance, non-utility industry firms listed on the NYSE, AMEX or NASDAQ markets with such audit opinions published between 01.01.1994 and 31.12.2002. Mean BHARs using a control firm benchmark are calculated as described in panel B of table 5.3.

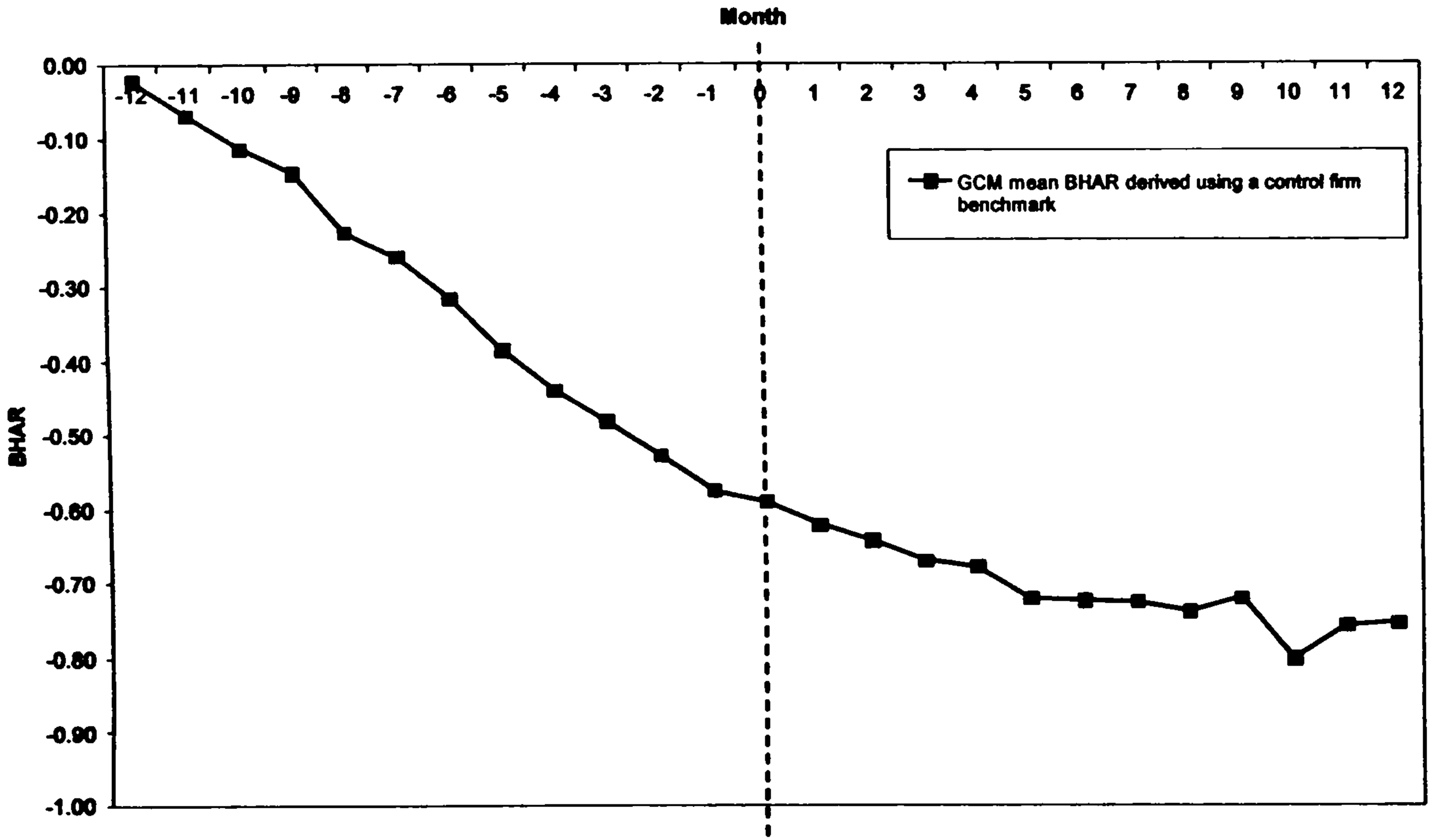
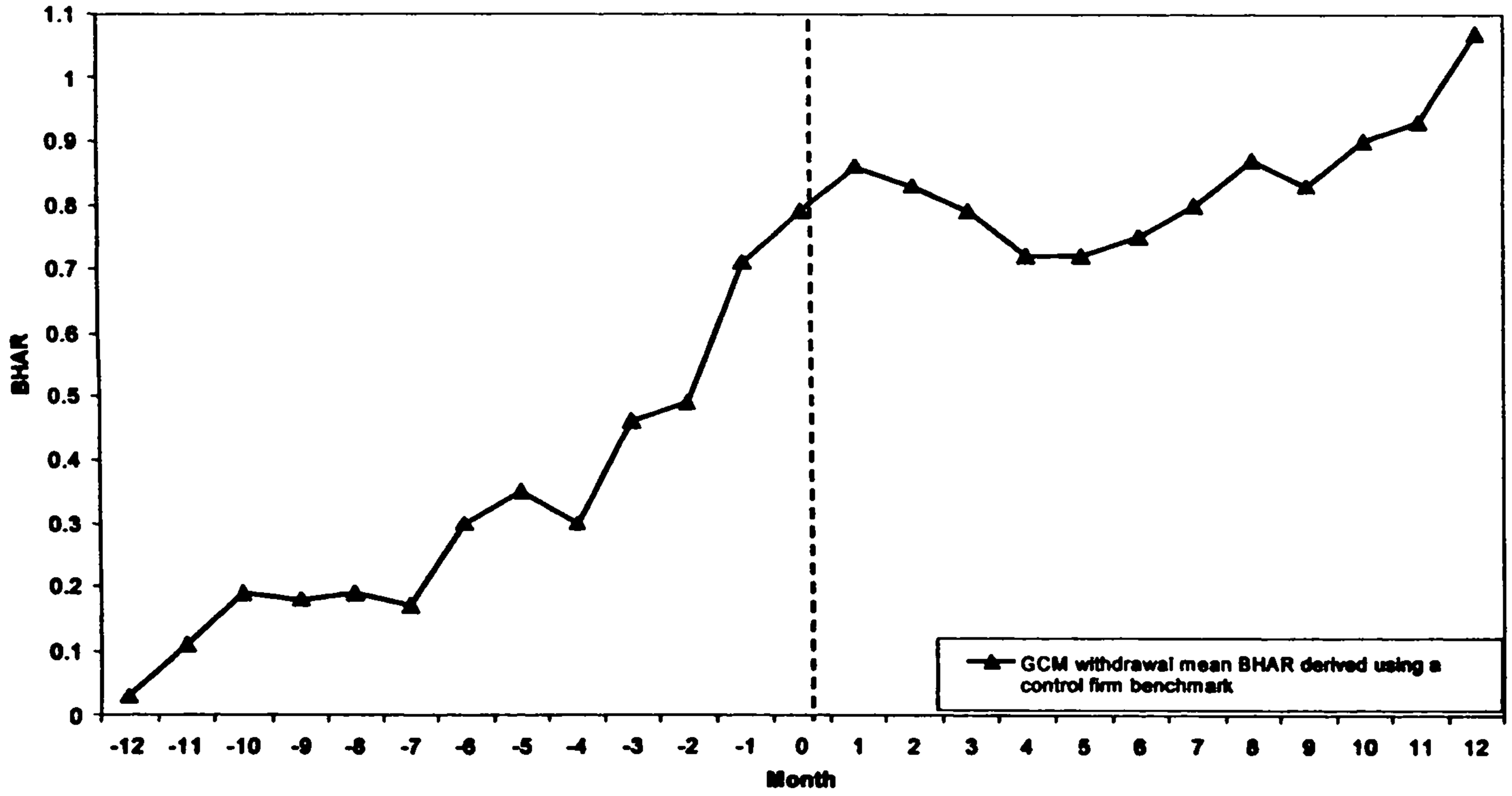


**FIGURE 5.2**

**Twelve Month Pre and Post-going-concern Modified Withdrawn Audit Report Announcement Mean Buy-and-hold Abnormal Returns**

This figure graphs the mean buy-and-hold abnormal returns (BHARs) for 12 months before and 12 months after the publication of a first-time going-concern modified withdrawn audit report for my population of 122 non-finance, non-utility industry firms listed on the NYSE, AMEX or NASDAQ markets with such audit opinions published between 01.01.1994 and 31.12.2002. Mean BHARs using a control firm benchmark are calculated as described in table 5.2.



Due to problems of extreme skewness in longer horizon studies (e.g. Fama, 1998), which can be very acute in the case of small firms (Ball, Kothari and Shanken, 1995), I also report sign test results in table 5.3. Ang and Zhang (2004), in their large simulation study, find that single matching firm benchmarks employed together with the simple Fisher sign test produce some of their most robust results. Importantly, they demonstrate this is the only test without significant loss of power in the case of small firms. As can be seen, these results also corroborate the evidence presented above.

The results of this sub-section show that there is no apparent abnormal market reaction in the 12-month period following the GCM withdrawal announcement event. This means that the market is efficient in dealing with this positive news event. On the other hand, the market underreacts to the bad news event i.e., issuance of the GCM audit report, resulting in a subsequent downward drift after the announcement of GCM audit report. Overall, my findings are clearly inconsistent with the market efficiency paradigm. It is difficult to think of any theoretical reason which supports the notion of firms straying away from their fundamental values in the case of bad news which is already in the public domain, for such an extended time period, whereas there is no abnormal response to good news. Based on my results, I thus conclude that the market responds asymmetrically to good and bad news in the financial distress domain, good news is anticipated completely while bad news is not. These results strongly reject the null hypothesis H1, whereas, null hypothesis H2 cannot be rejected.

## 5.4. Do GCM Withdrawal Firm Characteristics Differ?

Table 5.2 shows how good news, as represented by subsequent going-concern opinion lifting, is fully anticipated with such firms experiencing a steady increase in their stock price right from the initial GCM announcement month until the publication of their next audit report.[36] However, returns for the non-withdrawal cases continue to decline over the same period. Removing the 122 GCM withdrawal firms from my full GCM sample, I find that the 12-month mean (median) post-GCM announcement month BHARs for the remaining 723 non-GCM lifting firms are -34% (-22%) in contrast to -16% (-17%) for the full sample.[37] This clearly shows that the two subsets have very different subsequent return patterns following the publication of the GCM audit report. Is it possible to distinguish future GCM withdrawal cases from non-withdrawals at the time of the first-time GCM audit report publication?

To answer this question, I first look at the 12-month BHARs prior to GCM audit report issuance for the two groups separately and then, additionally, conduct a multivariate analysis in the form of a binary logistic regression model. Prior 12-month (t-12 to t-1) mean (median) BHARs for the GCM non-withdrawal sample (n=723) are -59% (-48%) and for the GCM withdrawal sample (n=122) are -50% (-45%). Neither difference is significant at any conventional level, suggesting similar prior return patterns across the two sub-samples. Next, I run the logistic regression model equation (5), presented and discussed in chapter 4, to ex ante predict subsequent GCM withdrawals from the GCM sample. The results are presented in table 5.4.

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[36] Month zero mean (median) abnormal returns for the GCM non-withdrawal (n=723) and GCM withdrawal firms (n=122) are -5% (-8%) and 10% (4%) respectively, all significant at better than the 1% level. Mean (median) differences are also significant at the same level.

[37] These cases include those firms delisted (n=426) as well as those still listed (n=297) but with a continuing GCM audit report in their following year 10-Ks.

**TABLE 5.4**

**Multivariate Analysis of the Characteristics Distinguishing GCM Withdrawal and GCM Non-withdrawal Cases**

This table presents the results of a multivariate analysis comparing the characteristics of the 122 firms in my population of 845 non-finance, non-utility industry firms listed on the NYSE, AMEX or NASDAQ which published a going-concern audit report (GC) for the first time between 01.01.94 and 31.12.2002 at the time of their GC announcement, and which had this lifted in their next year's 10-Ks (GC withdrawal cases), and the remaining 723 firms (GC non-withdrawal cases). Panel A provides the results of running the following binary logistic regression model where the dependent variable GCW=1 when GC firm i has its going-concern audit report withdrawn, and 0 otherwise: $\Pr(GCW_i = 1) = e^{zi}/(1+e^{zi})$, where $z_i = \lambda_0 + \lambda_1 AR0_i + \lambda_2 ROA_i + \lambda_3 CR_i + \lambda_4 LEV_i + \lambda_5 DIVID_i + \lambda_6 Z\text{-}SCORE_i + \lambda_7 LN(SIZE)_i + \lambda_8 BM_i + \lambda_9 MOM_i + \lambda_{10} SUE_i + \lambda_{11} AUDITOR_i + u_i$. Panel B provides the classification matrix using a probability cut-off of 0.15 representing the approximate ex post probability of a subsequent going-concern lifting case (122/845).

Panel A: Binary logistic regression model analysis

| Independent variable | Expected sign | Coefficient | Wald | p-value |
|---|---|---|---|---|
| Intercept | | -2.582 | 42.329 | .000 |
| AR0 | + | .524 | 6.933 | .008 |
| ROA | + | .140 | .434 | .510 |
| CR | + | -.071 | .598 | .439 |
| LEV | - | .137 | .110 | .741 |
| DIVID | + | .007 | .001 | .978 |
| Z-SCORE | + | .029 | 1.010 | .315 |
| LN(SIZE) | + | .376 | 19.183 | .000 |
| BM | - | -.045 | .774 | .379 |
| MOM | + | -1.536 | 1.304 | .253 |
| SUE | + | .073 | 1.219 | .270 |
| AUDITOR | ? | -.001 | .000 | .998 |

Model $\chi^2$ (d.f. = 11) = 38.64 with $p = 0.000$

AR0 = GC month abnormal return, ROA = return on assets (net income/total assets), CR = current ratio (current assets/current liabilities), LEV = leverage proxy defined as total debt/total assets, DIVID = dividend paid dummy (1 if dividend paid, 0 if nominal or omission), Z-SCORE = financial distress z-score (Altman (1968)), LN(SIZE) = natural log of market value measured by market capitalisation in $ million at the end of the calendar month of audit report publication date, BM = book value of assets divided by market capitalisation at the end of the calendar month of audit report publication date, MOM = monthly average of prior 11 months (t-12 to t-2) raw returns, SUE = standardised unexpected earnings for the last quarter of the fiscal year to which the going-concern opinion relates, AUDITOR = audit quality proxy dummy (1 if Big5/Big6, 0 otherwise), $\lambda_0 \ldots \lambda_{11}$ are the regression parameter estimates and $u_i$ is a mean zero stochastic error term.

Panel B: Classification table

| Observed | | Predicted | | |
|---|---|---|---|---|
| | N | GCM Withdrawal | GCM non-withdrawal | % correct classification |
| GCM withdrawal | 122 | 65 | 57 | 53.3 |
| GCM non-withdrawal | 723 | 239 | 484 | 66.9 |
| Overall | 845 | | | 65.0 |

Panel A of table 5.4 shows the logistic regression model to be highly significant on a statistical basis (Wald $\chi^2$ = 38.6, p-value = 0.000) although only size (LN(SIZE)) and GCM month abnormal returns (AR0) differ significantly between the GCM non-withdrawal and GCM withdrawal firms.[38] However, panel B shows that the model has poor predictive ability with an overall correct classification rate of only 65%. As such, it is not possible to distinguish meaningfully between the two groups on this basis. Overall the results of my two sets of analyses suggest that the characteristics of GCM withdrawal firms are not reliably different to non-withdrawal cases at the initial GCM stage.

## 5.5. Tests of the Behavioural Finance Models

In this section, I try to relate the empirical evidence, presented in tables 5.2 and 5.3 above, to the three behavioural finance models of Barberis, Shleifer and Vishny (1998), Daniel, Hirshleifer, and Subrahmanyam (1998), and Hong and Stein (1999) and test the null hypotheses 3, 4, and 5 presented below. The idea is to see how the behavioural finance models perform. Chan, Frankel and Kothari (2004) point out that assessing the predictive ability of behavioural hypotheses using new data or events is important and my U.S. GCM sample provides an ideal opportunity for such tests.

***H3 (BSV): Irrespective of the nature of the news, sample firms with a positive (negative) shock prior to the event followed by another positive (negative) shock (on the announcement date) should not underreact to new information and no underperformance should be observed in the post announcement period.***

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[38] The correlation coefficient between GCM firm month zero abnormal returns and post-GCM 12-month BHARs for all firms is only -0.02, not significantly different to zero at any conventional levels.

***H4 (DHS): If overconfident investors observe a non-selective event then firms with positive (negative) pre-event returns should not underreact to announcement period negative (positive) news and should not underperform in the post-event period.***

***H5 (HS): Even if private information diffuses gradually among newswatchers and sample firms exhibit underreaction prior to the event being released in the public domain then these firms should not underreact in the short-run after the announcement and momentum-traders should not be able to cause longer-run overreaction.***

If these behavioural finance models correctly describe investor behaviour and any of the alternatives of the above hypotheses hold, I would expect the pattern of pre- and post-GCM announcement abnormal returns as presented in tables 5.2 and 5.3 to be in line with the prediction of these models. The primary criticism of these three models is that they do not condition abnormal price behaviour on the nature of the news and therefore do not predict differential response to good and bad news which is exactly what I find in my data. However, if we only look at the bad news case then BSV's and HS's models perform relatively better than DHS. DHS predicts a positive (negative) price run up before a bad (good) news event followed by underreation which is refuted by my data. DHS model's key to the drift after an event results from the combination of underreaction (due to overconfidence of private information and biased self-attribution of public signals) and event selection based on market mispricing. So hypothesis 4 is not at all supported by the data.

BSV's model (hypothesis 3) predicts firms with a positive (negative) shock prior to the event followed by another positive (negative) shock (on the announcement date) should underreact to new information and continue to underperform in the post announcement period. The problem with this hypothesis is an appropriate measure of prior shock. BSV developed this specific version of their model to capture post-earnings announcement drift. So if one chooses earnings as a criterion for shocks then it has to be consistent across two time periods, the announcement date shock and shock on a date prior to the announcement date. Applying this to the going-concern framework, a GCM audit report followed by another GCM audit report could be one possible test of their model. By implication this means that their model does not predict underreaction if prior period shock is not consistent with event date/month shock, which is what my GCM sample constitutes of, a clean report followed by a modified report. More consistent is the explanation of Griffin and Tversky (1992) framework adopted by BSV (1998) which predicts underreaction because investors are unimpressed by the low strength of the signal (publication of the GCM audit report) and react mildly to the evidence, even though its weight (in this financial distress context) calls for a larger reaction. An analogy of Griffin and Tversky's example of a recommendation letter was previously related to the auditor report. A modified report will represent the strength of the auditor's statement while how credible the auditor is would be its weight. Therefore, one possible explanation could be that investors react mildly to the strength of the audit report i.e. a modified audit report because they have doubts about the credibility of the auditor.

Now turning towards the HS (1999) model (hypothesis 5), which predicts a gradual diffusion of private information. My pre-event results generally support their

argument because we see a gradual anticipation of news before the event date. Hong, Lim and Stein (2000), in the case of momentum, report results which are supportive of the HS (1999) model. They argue that negative firm-specific information diffuses only gradually across the investing public particularly in the case of small poorly followed firms, which applies in my case, as managers have less incentive to bring investors up to date quickly. Their argument was based on explaining the case of momentum for losers firms. However, this explanation is doubtful in my GCM firm context because the news (publication of the GCM audit report) is disclosed in the public domain and investors' inability to assimilate public domain negative information maintains for a subsequent period of a whole year. This argument does question the applicability of the HS (1999) model to the longer horizon event study framework in the case of the underreaction anomaly.

My empirical evidence presented above, as also demonstrated by other studies, is clearly inconsistent with all three theoretical behavioural finance models. To sum up, these models only fit (theoretically) the anomalies they were designed to explain (Fama, 1998) and generally fall short in the face of new empirical evidence in an out-of-sample context.

## 5.6. Summary

A number of studies suggest that the stock price reaction to various news events is often incomplete. Generally, these studies find that the market underreacts to news resulting in a post-event drift lasting for several months. Most of these studies also demonstrate that the market underreaction phenomenon is more pronounced to bad news situations (see chapter 2). However, Fama (1998) argues that the market

underreaction to certain news events is due to chance. I demonstrate, however, that if we have an event where the distinction between bad and good news is very clear, by using such an event we can offer an appropriate test for the market underreaction phenomenon.

This chapter examines the market underreaction hypothesis using the going-concern audit report disclosure event which is a key output of the accounting system. The auditor's going-concern opinion in his/her audit report is of particular importance because it is a *mandatory*, independent and direct public-domain signal of firm financial distress. As part of the audit procedure for all publicly-listed firms, the auditor is required to assess the going-concern viability of the entity and communicate his/her assessment in the audit opinion which accompanies the financial statements. It thus constitutes a unique and an unambiguous extreme bad news event. Such a disclosure casts doubt over the ability of the firm to continue to operate in its present form in the medium-term, highlighting an increased risk of bankruptcy. Similarly, the opposite is true when such an opinion is lifted by the auditor (going-concern withdrawal) in a subsequent audit report. Therefore, going-concern opinions offer a clean test for studying medium-term market reaction to such bad and good news disclosures, providing important empirical evidence on the market underreaction phenomenon conditional on the nature of the news.

I study 12-month pre- and post-event monthly returns following the publication of the GCM audit report (bad news) and its withdrawal (good news) in their 10-Ks by firms traded on the NYSE, AMEX, and NASDAQ. In particular, I investigate whether the market fully impounds all the price relevant information by or around the information

release date or whether it subsequently underreacts (overreacts) to the bad (good) news event. My results show that GCM opinion (GCM withdrawal) firms' stocks experience a substantial decline (rise) in the 12-months prior to the GCM announcement month. Mean (median) buy-and-hold abnormal returns for GCM opinions and GCM withdrawn opinions for the prior 12-month period are -58% (-48%) and 71% (34%). In the 12-months subsequent to the GCM month, when such information is released into the public domain, I find that my GCM mean (median) sample firm underperforms by -16% (-17%), whereas, a year later, firms that have their GCM withdrawn experience no significant further market reaction. These results suggest that the market fully anticipates good news while underreacts to bad news, resulting in a subsequent downward drift over the one-year period following the going-concern opinion. These latter findings are anomalous as they contradict the traditional market efficiency paradigm.

I also test the three behavioural finance models of BSV (1998), DHS (1998) and HS (1999). The results of my empirical tests do not support these models. Although, these models pick and choose two cognitive biases or rely on two sets of traders to generate market behaviour in line with the anomalous empirical evidence prevalent at the time these models were developed, they fail to recognise the different potential implications of good new and bad news events. Dichev and Piotroski (2001) point out that a potential research question that emerges is whether the abnormal returns on the "downside" are more extreme because there are different information implications of good versus bad news, and investors fail to recognise this fact. The empirical evidence presented in this chapter addresses this question and finds that returns on the downside are in fact more extreme because of the different implications of bad news

and good news. The downside risk in the case of my GCM sample firms is a very high risk of potential bankruptcy and that is what I find in my sample. Over 44% of my first-time GCM firms either file for bankruptcy or are delisted due to performance reasons, providing evidence consistent with their proposition. In fact between 1994 and 2002, 14.7% of non-finance industry, non-utility firms listed on the NYSE, AMEX or NASDAQ with first-time going-concern opinions entered into bankruptcy proceedings in the following year. This compares with a population base rate of 1.6% (difference p-value = 0.000).

Additionally, my results support those short-term event studies suggesting that the going-concern opinion event itself is valuable to investors because it conveys information which affects stockholder wealth. My results also have clear public policy implications since I have shown that despite clear messages being conveyed by auditors to investors, their information is not being fully impounded by the market on a timely basis leading to trades taking place at prices apparently inconsistent with fair value.

This first empirical chapter confirms the market underreaction hypothesis and shows that the market response is more pronounced to bad news (publication of GCM audit report) than good news (publication of GCM withdrawn audit report) and reveals the inability of the market to deal with this pessimistic information on a timely basis as opposed to good news. In chapter 6, I conduct additional tests to seek other possible explanations for investor underreaction to bad news phenomenon.

# CHAPTER 6

# IS THE POST-GCM DRIFT DISTINCT FROM EXISTING EXPLANATIONS?

## 6.1. Introduction

The last chapter demonstrates that the market underreacts to bad news disclosures, whereas good news is assimilated in a timely manner into stock prices. I conduct a range of additional tests to see if the post-going-concern modified audit report announcement drift in stock returns is due to alternative explanations already documented in the literature. I do not examine GCM withdrawals further as their market reaction is consistent with the market efficiency paradigm. In the bad news case, it is possible that the anomalous response by firms to the GCM announcement event could be due to a "correlated omitted variable", or a missing risk factor. In this chapter, I explicitly test for other possible explanations already documented in the literature.

This chapter is organised as follows: section 2 tests hypotheses 6 to 11 presented in chapter 3. These hypotheses are designed to test for earnings surprise, size, momentum, distress risk, low price stocks, and industry. Section 3 presents the summary and discusses the results.

## 6.2 Test of Hypotheses

In this chapter I conduct formal tests of hypotheses 6 to 11 discussed in chapter 3. These hypotheses, as mentioned above, are designed to test for other explanations of the market underreaction phenomenon documented in the previous chapter.

### *6.2.1 Earnings surprise and the post-GCM drift*

It is quite possible that the post-GCM drift merely proxies for earnings surprise, since most GCM firms in my sample also experience contemporaneous negative earnings surprises. Bernard and Thomas (1989, 1990) document that extreme negative earnings changes are followed by abnormally low returns. Therefore, it is important to investigate the possibility of a post-earnings announcement drift effect in my results. I thus test the following null hypotheses:

***H6a: There is no difference in the returns of GCM firms with positive earnings change and negative earnings change.***

***H6b: There is no difference in the returns of GCM firms and non-GCM firms with similar earnings change.***

I attempt to distinguish between the two drifts (post-GCM announcement and post-earnings announcement) in two ways. Following Dichev and Piotroski (2001), I split my sample based on the sign of the quarterly earnings change (earnings surprise). I then separately match my sample firms on a one-to-one basis with firms with the same size and similar earnings surprise element but with no audit going-concern modification. Firstly, for each calendar year during my sample period from 1994-2002 inclusive, I identify the population of non-financial, non-utility NYSE, AMEX and NASDAQ firms with quarterly earnings figures, excluding all firms with GCMs from the data used in the control firm approach analysis outlined in section II above. I then identify all firms with a market value of equity of between 70% and 130% of the market value of equity of the sample firm at the end of the GCM month; from this set

of firms I choose the firm with the closest earnings change to the sample firm's quarterly earnings change. A non-GCM firm is only excluded from the population in a particular quarter if it does not have an earnings change ratio in that quarter. I assume a two-month accounting lag for firms with missing quarterly announcement dates in the COMPUSTAT file.

In this way I am able to separate out the post-GCM abnormal return after controlling for any post-earnings change drift effects, since the matched firms have the same earnings changes as the sample firms but without a GCM audit report. The abnormal return of the sample firm in each case is calculated as the buy-and-hold raw return of the sample firm minus the buy-and-hold raw return of the matched firm.

Following existing post-earnings-announcement drift research (e.g., Foster, Olsen, and Shevlin, 1984 and Bernard and Thomas, 1989, 1990), I define quarterly earnings change as income before extraordinary items (COMPUSTAT item 8) less income from the same quarter in the previous year. More specifically, earnings change (surprise) is defined as current quarterly earnings (quarter q) – last year's same quarter earnings (quarter q–4) i.e. $\Delta NI_q = NI_q - NI_{q-4}$. The denominator is the absolute value of firm's current quarterly earnings figure $|NI_q|$.[39]

In the first part of my analysis I investigate if there is any difference in abnormal returns between firms with positive earnings surprise and negative earnings surprise among my GCM sample. I use the abnormal returns derived from the size and book-to-market matched control firms procedure and split the sample conditional on the

[39] This definition of unexpected earnings is the same as in model 1 of Foster, Olsen, and Shevlin (1984) and is conventionally known as standardised unexpected earnings (SUE).

sign of the earnings surprise ratio. I find that the drift is limited to negative earnings surprise firms. Table 6.1 presents these results.

**TABLE 6.1**
**First Time Going-concern Modified Audit Report Post-announcement Month Buy-and-hold Abnormal Returns Conditional on Sign of Quarterly Earnings Change Surprise**

This table presents buy-and-hold abnormal returns (BHARs) for my population of 845 non-finance, non-utility industry firms listed on the NYSE, AMEX and NASDAQ which published a going-concern modified audit report (GCM) for the first time between 01.01.1994 and 31.12.2002 conditional on the sign of the quarterly earnings change ratio. Returns earned by delisted firms are represented by the equivalent monthly return on the S&P 600 Small Cap. Index. The 12-month period reported commences on the first day of the month immediately following the going-concern modified audit report release month. This table provides mean and median BHARs derived from matching each GCM firm with a 'clean' control firm of same size and book-to-market. The GCM sample is further split based on its earnings change sign as at the most recent quarter prior to the publication of the GCM audit report. Quarterly earnings change is defined as income before extraordinary items (COMPUSTAT Item 8) less income from the previous year in the same quarter expressed as a percentage of the absolute value of current quarterly earnings, conventionally known as standardised unexpected earnings (SUE).

Each GCM firm in my population is matched with that non-financial, non-utility, non-GCM firm with most similar size and book-to-market ratios. Specifically, all non-financial, non-utility firms without GCM audit reports listed on the NYSE, AMEX or NASDAQ are first identified with a market value of equity between 70% and 130% of that of the sample firm. The control firm is then selected as that firm with book-to-market ratio closest to that of the sample firm.

| | Negative earnings surprise GCM firms (n=595) | | Positive earnings surprise GCM firms (n=250) | | Difference | |
|---|---|---|---|---|---|---|
| | 6-month | 12-month | 6-month | 12-month | 6-month | 12-month |
| Mean BHAR | -0.21 | -0.26 | 0.04 | 0.07 | -0.24 | -0.32 |
| t-value | -4.65 | -3.52 | 0.58 | 0.54 | -3.05 | -2.35 |
| Median BHAR | -0.21 | -0.22 | -0.04 | -0.04 | -0.17 | -0.18 |
| Wilcoxon z-value | -6.10 | -5.89 | -0.47 | -0.02 | | |
| Sign test z-value | -6.81 | -5.25 | -0.57 | -0.44 | | |
| Mann-Whitney Z | | | | | -2.99 | -3.33 |

As can be seen, the 12-month mean (median) abnormal returns for my GCM sample with negative earnings surprise are -26% (-22%) and equivalent abnormal returns at the 6-month stage are -21% (-21%), all significant at better than the1% level. On the other hand, 12-month mean (median) abnormal returns for positive earnings surprise firms are 7% (-4%) with the equivalent statistics at the 6-month stage 4% (-4%), none

being distinguishable from zero at conventional levels. The differences between group statistics are also significant at conventional levels for both the 6-month and 12-month stage. These results suggest that there is no evidence of market underreaction for GCM firms with positive earnings surprise ratio and the null hypothesis H6a is rejected. This means that earnings expectations play an important role and the going-concern opinion only has an adverse impact on market prices if the GCM firm also has a negative earnings surprise ratio.

From the above results, it is not clear whether the GCM drift is distinct from the post-earnings announcement drift as negative earnings changes are also followed by low abnormal returns (Bernard and Thomas, 1989, 1990). I make a further attempt to control for any potential post-earnings announcement drift in my GCM sample by using the second approach mentioned above. These new analyses show that my GCM sample firms still exhibit strong post-GCM abnormal return drift.[40] Table 6.2 provides the quarterly earnings change ratio results. Twelve-month (6-month) mean buy-and-hold abnormal returns are -17% (-9%) and 12-month (6-month) median buy-and-hold abnormal returns are -16% (-15%). All are significant at the 1% level, or better, as are the simple Fisher sign-test results reported in the penultimate column of the table. Based on these results I reject the null hypothesis H6b.

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[40] Mean (median) sample and control firm quarterly earnings change (SUE) ratios are -11% (-50%) and -11% (-50%). Thus, it is unlikely that my results are biased by problems in my control firm matching process.

**TABLE 6.2**

**First Time Going-concern Modified Audit Report Post-announcement Month Buy-and-hold Abnormal Returns Adjusted for Post-earnings Announcement Drift Effects**

This table presents buy-and-hold abnormal returns (BHARs) for my population of 845 non-finance, non-utility industry firms listed on the NYSE, AMEX and NASDAQ which published a going-concern modified audit report (GCM) for the first time between 01.01.1994 and 31.12.2002 adjusted for post-earnings announcement drift effects. Returns earned by delisted firms are represented by the equivalent monthly return on the S&P 600 Small Cap. Index. The 12-month period reported commences on the first day of the month immediately following the going-concern modified audit report release month. Panel A provides mean and median BHARs derived from matching each GCM firm with a 'clean' control firm of same size and with the closest change in quarterly earnings (COMPUSTAT Item 8) as a percentage of absolute value of current earnings, conventionally known as standardised unexpected earnings (SUE).

The table is derived on the following basis. First, the population of non-financial, non-utility firms listed on the NYSE, AMEX and NASDAQ traded firms with two consecutive quarterly earnings figures excluding all firms with GCMs is identified for each year during my sample period. I then identify all firms with a market value of equity between 70% and 130% of the market value of equity of the sample firm at the end of the GCM month; from this set of firms I choose the firm with the closest quarterly earnings change ratio to the sample firm's quarterly earnings change. A non-GCM firm is only excluded from the population in a particular quarter if it does not have an earnings change ratio in that quarter. I assume a 2-month accounting lag for firms with missing quarterly announcement dates in the COMPUSTAT file. Control firm matching is conducted on the basis of $\Delta NI_q / |NI_q|$. $\Delta NI_q = NI_q - NI_{q-4}$ where $NI_q$ denotes income before extraordinary items (COMPUSTAT item 8) for quarter t.

| Month | Mean BHAR | t-value | Median BHAR | Wilcoxon z-value | Sign test z-value | Number of surviving firms |
|---|---|---|---|---|---|---|
| 1 | -0.01 | -0.73 | -0.05 | -2.62 | -2.53 | 783 |
| 2 | -0.03 | -1.41 | -0.07 | -3.00 | -3.63 | 738 |
| 3 | -0.07 | -2.05 | -0.09 | -3.74 | -3.97 | 707 |
| 4 | -0.07 | -2.13 | -0.11 | -4.37 | -4.32 | 645 |
| 5 | -0.09 | -2.65 | -0.13 | -4.55 | -5.70 | 598 |
| 6 | -0.09 | -2.64 | -0.15 | -4.52 | -4.32 | 559 |
| 7 | -0.11 | -3.04 | -0.16 | -4.64 | -4.73 | 528 |
| 8 | -0.13 | -3.02 | -0.15 | -4.68 | -4.94 | 501 |
| 9 | -0.13 | -2.73 | -0.15 | -4.86 | -4.46 | 482 |
| 10 | -0.18 | -3.06 | -0.15 | -4.88 | -4.46 | 464 |
| 11 | -0.16 | -2.67 | -0.16 | -5.21 | -4.59 | 440 |
| 12 | -0.17 | -2.53 | -0.16 | -5.27 | -4.87 | 419 |

I conclude that my post-GCM drift documented in the previous chapter is not contaminated by any potential post-earnings announcement drift effect. Interestingly, the GCM underreaction effect is limited to negative earnings surprise firms only. This indicates that the adverse GCM signal is somewhat mitigated when accompanied by a positive earnings surprise element. I speculate this behaviour is consistent with the market focusing on the earning surprise element rather more than the GCM *per se*. However, in terms of subsequent one-year performance delisting status, the percentage of positive and negative earnings change GCM firms does not differ significantly (37% v 47%).[41,42] So, apparently, market mispricing is concentrated in GCM firms with negative earnings change, even though the two categories have more or less similar subsequent failure profiles.

### *6.2.2. Firm size and the post-GCM drift*

The mean market capitalisation of my GCM firms as shown in Table 5.1 is $33.8 million, with median of only $12.3 million, highlighting the high degree of skewness in my firm size distribution. As such, it is not meaningful to conduct value-weighted analysis as suggested by Fama (1998). Furthermore, existing research demonstrates that abnormal returns are stronger for smaller firms (e.g., Bernard and Thomas (1989), Fama (1998)). I, therefore, test the following null hypothesis:

***H7: There is no difference in the returns of GCM firms of small firm size and relatively large firm size.***

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[41] Mean (median) delisting returns for positive earnings surprise and negative earnings surprise GCM firms are -28% (-27%) and -32% (-34%), neither difference is significant at any conventional levels.
[42] The standardised unexpected earnings (SUE) GCM firm decile distribution shows that my lack of ability to find negative abnormal returns in the case of GCM firms with positive earnings surprise is mainly due to the 119 firms that are in deciles 9 and 10. However, there is little difference in the subsequent failure profiles of these firms with a delisting rate of 37% and actual mean (median) delisting returns of -27% (-28%).

To test the sensitivity of my results to firm size I split my 845 cases into two portfolios based on market capitalisation below or above the median and then compare their abnormal returns.[43] GCM firms with market capitalisation below the median are classified as my small size portfolio (n=423) and GCM firms with market capitalisation above the median form my large size portfolio (n=422). Small portfolio mean (median) market capitalisation is $6.0 million ($5.6 million) compared with large firm portfolio mean (median) market capitalisation of $61.7 million ($29.4 million). Table 6.3 presents buy-and-hold abnormal returns derived using a control firm benchmark for my two size portfolios separately, together with their differences.

**TABLE 6.3**
**First Time Going-concern Modified Audit Report Post-announcement Month Buy-and-hold Abnormal Returns Conditional on Firm Size**

This table presents buy-and-hold abnormal returns (BHARs) for my population of 845 non-finance, non-utility industry firms listed on the NYSE, AMEX and NASDAQ which published a going-concern modified audit report (GCM) for the first time between 01.01.1994 and 31.12.2002. The table provides results separately for the portfolio of 423 firms with market capitalisation at the end of the audit report publication month below the population median ($12.25 million) and the parallel portfolio made up of the 422 firms with market capitalisation above the population median. Mean and median portfolio results are provided separately for the 6-month and 12-month periods commencing on the first day of the month immediately following the going-concern modified audit report release month. This table provides mean and median BHARs using a control firm benchmark for the two size based portfolios separately together with their differences. Control firms are selected as described in table 5.2.

| | Small size (n=423) | | Large size (n=422) | | Difference | |
|---|---|---|---|---|---|---|
| | 6-month | 12-month | 6-month | 12-month | 6-month | 12-month |
| Mean BHAR | -0.14 | -0.22 | -0.13 | -0.11 | 0.01 | 0.11 |
| t-value | -2.34 | -2.43 | -3.07 | -1.24 | 0.15 | 0.85 |
| Median BHAR | -0.13 | -0.16 | -0.18 | -0.18 | 0.05 | 0.02 |
| Wilcoxon z-value | -3.32 | -3.17 | -4.35 | -3.91 | | |
| Sign test z-value | -3.50 | -2.72 | -5.01 | -3.85 | | |
| Mann-Whitney Z | | | | | 0.33 | 0.25 |

[43] Division of groups based on NYSE decile breakpoints as is conventionally done is not appropriate in my case as over 94% of my sample falls in the bottom NYSE size decile.

Twelve-month (6-month) mean BHARs for the below median size portfolio are -22% (-14%) and for the above median size portfolio -11% (-13%). Three of these four results differ significantly to zero at the 5% level or better. However, there is no significant difference in either the 12-month or the 6-month mean BHARs between the two size portfolios at conventional levels. Equivalent median BHAR 12-month (6-month) results for the below median portfolio are -16% (-13%) and for the above median portfolio -18% (-18%) with all percentages significant at the 5% level or better. Mann-Whitney test results similarly indicate no significant differences in the respective portfolio medians at conventional levels.[44] On this basis, then, the null hypothesis H7 cannot be rejected and I have no evidence consistent with market mispricing being more concentrated among the smaller firms in my GCM population.

### *6.2.3. Financial distress explanation of the post-GCM drift*

Table 5.1 demonstrates the acutely financially distressed characteristics of my 845 GCM firms. Dichev (1998) and Griffin and Lemmon (2002) show that highly distressed firms underperform the less distressed ones. To test whether my underreaction to GCM disclosures can be explained by a financial distress factor I test the following null hypotheses:

***H8a: There is no difference in the returns of less financially distressed GCM firms and highly financially distressed GCM firms.***

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[44] That the correlation coefficients between firm size and 12-month (6-month) BHARs of 0.05 (0.04), are effectively zero, further corroborate my findings.

***H8b: There is no difference in the returns of GCM firms and non-GCM firms with similar financial distress levels.***

I essentially follow the same procedures described above to test null hypotheses 8a and 8b. That is, first I split my sample firms into a high distress risk portfolio (z-score <1.8) and a low distress risk portfolio (z-score>1.8) to see if their abnormal returns differ. I use Altman (1968) z-score model for calculating a financial distress risk measure. The cut-off of 1.8 which I use is also based on Altman's (1968) criteria of distinguishing firms into varying degrees of probability of failure. Firms with a z-score of less than 1.8 have a very high probability of failure.[45] Then, in a separate analysis, I match each of my GCM firms with a non-GCM non-finance, non-utility control firm on size and z-score and compare subsequent returns. Results are presented in tables 6.4 and 6.5.

[45] Begley, Ming, and Watts (1997) suggest that a z-score cut-off of 1.8 might not be very meaningful, so I rerun my analysis using the median z-score of -0.47 to define high and low distress risk groups. The results are qualitatively no different to those reported above. The negligible correlation coefficients between z-score and 12-month (6-month) BHARs of -.05 (-.02), additionally reinforce the absence of a financial distress risk explanation for my findings.

**TABLE 6.4**

## First Time Going-concern Modified Audit Report Post-announcement Month Buy-and-hold Abnormal Returns Conditional on distress risk

This table presents buy-and-hold abnormal returns (BHARs) for my population of 845 non-finance, non-utility industry firms listed on the NYSE, AMEX and NASDAQ which published a going-concern modified audit report (GCM) for the first time between 01.01.1994 and 31.12.2002. The table provides results separately for the portfolio of 712 firms with z-scores below 1.8 and the parallel portfolio made up of the 133 firms with z-scores above 1.8. Z-scores are derived from information published concurrently with the GCM audit report in the 10-K. Mean and median portfolio results are provided separately for the 6-month and 12-month periods commencing on the first day of the month immediately following the going-concern modified audit report release month. This table provides mean and median BHARs using a control firm benchmark for the two z-score based portfolios separately together with their differences. Control firms are selected as described in table 4.2.

| | High distress risk (z < 1.8) (n=712) | | Low distress risk (z > 1.8) (n=133) | | Difference | |
|---|---|---|---|---|---|---|
| | 6-month | 12-month | 6-month | 12-month | 6-month | 12-month |
| Mean BHAR | -0.10 | -0.14 | -0.30 | -0.32 | 0.20 | 0.18 |
| t-value | -2.45 | -1.90 | -4.50 | -2.67 | 2.03 | 1.05 |
| Median BHAR | -0.13 | -0.16 | -0.31 | -0.22 | 0.18 | 0.06 |
| Wilcoxon z-value | -3.92 | -3.93 | -4.59 | -3.54 | | |
| Sign test z-value | -4.61 | -3.71 | -4.51 | -3.12 | | |
| Mann-Whitney Z | | | | | 2.7 | 1.38 |

**TABLE 6.5**
**First Time Going-concern Modified Audit Report Post-announcement Month Buy-and-hold Abnormal Returns Adjusted for Distress Risk Effects**

This table presents buy-and-hold abnormal returns (BHARs) for my population of 845 non-finance, non-utility industry firms listed on the NYSE, AMEX and NASDAQ which published a going-concern modified audit report (GCM) for the first time between 01.01.1994 and 31.12.2002 adjusted for distress risk effects. Returns earned by delisted firms are represented by the equivalent monthly return on the S&P 600 Small Cap. Index. The 12-month period reported commences on the first day of the month immediately following the going-concern modified audit report release month. This table provides mean and median BHARs derived from matching each GCM firm with a 'clean' control firm of same size and closest z-score.

The table is derived on the following basis. Each GCM firm in my population is matched with that non-financial, non-utility, non-GCM firm with most similar size and z-score. Specifically, all non-financial, non-utility firms without GCM audit reports listed on the NYSE, AMEX or NASDAQ are first identified with a market value of equity between 70% and 130% of that of the sample firm. The control firm is then selected as that firm with z-score closest to that of the sample firm.

| Month | Mean BHAR | t-value | Median BHAR | Wilcoxon z-value | Sign test z-value |
|---|---|---|---|---|---|
| 1 | -0.08 | -3.54 | -0.08 | -4.84 | -4.95 |
| 2 | -0.12 | -5.05 | -0.13 | -6.75 | -6.88 |
| 3 | -0.16 | -4.71 | -0.16 | -7.23 | -7.91 |
| 4 | -0.16 | -4.85 | -0.18 | -7.51 | -7.84 |
| 5 | -0.20 | -5.22 | -0.21 | -7.82 | -8.19 |
| 6 | -0.18 | -5.05 | -0.20 | -7.56 | -6.54 |
| 7 | -0.25 | -5.31 | -0.24 | -8.09 | -7.02 |
| 8 | -0.25 | -5.90 | -0.21 | -7.62 | -6.81 |
| 9 | -0.28 | -5.64 | -0.22 | -7.68 | -7.77 |
| 10 | -0.33 | -5.73 | -0.23 | -7.81 | -7.09 |
| 11 | -0.39 | -5.66 | -0.22 | -7.65 | -6.40 |
| 12 | -0.36 | -5.17 | -0.20 | -7.35 | -6.19 |

To test null hypothesis 8a I investigate any abnormal return difference between my high distress risk portfolio and low distress risk portfolio. Table 6.4 shows that negative abnormal returns on my high distress risk and low distress risk portfolios are not very different. In fact, the latter portfolio (n=133) appears to perform worse than the former (n=712) with 12-month mean (median) BHARs of -31% (-22%) compared with -14% (-16%) but their differences are not significant. Based on these results I cannot reject null hypothesis H8a. To test null hypothesis 8b, I use the control firm approach mentioned above. Table 6.5 shows mean (median) 12-month BHARs are

-36% (-20%), both highly significant at conventional levels, leading me to reject the null hypothesis H8b. These findings suggest that my post-GCM drift does not have a financial distress risk explanation.

### *6.2.4. Momentum and the post-GCM drift*

Figure 5.1 provides some evidence on a face value basis consistent with the argument that all we are experiencing is continuation of negative returns as with Jegadeesh and Titman (1993, 2001). To test whether momentum is driving my results, I again adopt the same methodology as above and test the following two null hypotheses:

***H9a: There is no difference in the returns of low momentum GCM firms and high momentum GCM firms.***

***H9b: There is no difference in the returns of GCM firms and non-GCM firms with similar price momentum.***

To test null hypothesis H9a I first split my sample into two portfolios based on prior positive (>0) and negative (<0) momentum and then investigate if abnormal returns differ. Momentum is defined as the monthly average of the prior 11-months ($t_{-12}$, $t_{-2}$) raw returns. To test my null hypothesis H9b I separately match each GCM firm on size and momentum with a non-GCM, non-finance, non-utility control firm from the firms employed in the original control firm analysis in section 3.2.2 above. I then

compare their subsequent 12-month returns.[46] Results are presented in tables 6.6 and 6.7 to test H9a and H9b.

**TABLE 6.6**
**First Time Going-concern Modified Audit Report Post-announcement Month Buy-and-hold Abnormal Returns Conditional on prior momentum**

This table presents buy-and-hold abnormal returns (BHARs) for my population of 845 non-finance, non-utility industry firms listed on the NYSE, AMEX and NASDAQ which published a going-concern modified audit report (GCM) for the first time between 01.01.1994 and 31.12.2002. The table provides results separately for the portfolio of 635 firms with price momentum below 0 and the parallel portfolio made up of the 210 firms with prior price momentum above 0. Momentum is the prior 11-month (t-12 to t-2) average raw returns. Mean and median portfolio results are provided separately for the 6-month and 12-month periods commencing on the first day of the month immediately following the going-concern modified audit report release month. This table provides mean and median BHARs using a control firm benchmark for the two momentum based portfolios separately together with their differences. Control firms are selected as described in table 4.2.

| | Negative Momentum (< 0) (n=635) | | Positive Momentum (> 0) (n=210) | | Difference | |
|---|---|---|---|---|---|---|
| | 6-month | 12-month | 6-month | 12-month | 6-month | 12-month |
| Mean BHAR | -0.13 | -0.15 | -0.14 | -0.21 | 0.01 | 0.06 |
| t-value | -2.93 | -1.96 | -2.68 | -1.92 | 0.03 | 0.45 |
| Median BHAR | -0.19 | -0.17 | -0.10 | -0.19 | -0.09 | 0.02 |
| Wilcoxon z-value | -4.53 | -4.13 | -2.97 | -2.82 | | |
| Sign test z-value | -5.00 | -3.81 | -3.38 | -2.69 | | |
| Mann-Whitney Z | | | | | 0.67 | 0.93 |

[46] Mean (median) sample firm prior 11-month average monthly returns are -4.1% (-4.3%) and for the control firm sample -4.2% (-4.4%). Since there is no statistically significant difference between the two samples my results are unlikely to be biased by problems relating to poor firm matching.

**TABLE 6.7**
**First Time Going-concern Modified Audit Report Post-announcement Month Buy-and-hold Abnormal Returns Adjusted for Momentum**

This table presents buy-and-hold abnormal returns (BHARs) for my population of 845 non-finance, non-utility industry firms listed on the NYSE, AMEX and NASDAQ which published a going-concern modified audit report (GCM) for the first time between 01.01.1994 and 31.12.2002 adjusted for price momentum. Returns earned by delisted firms are represented by the equivalent monthly return on the S&P 600 Small Cap. Index. The 12-month period reported commences on the first day of the month immediately following the going-concern modified audit report release month. This table provides mean and median BHARs derived from matching each GCM firm with a 'clean' control firm of same size and closest momentum.

The table is derived on the following basis. Each GCM firm in my population is matched with that non-financial, non-utility, non-GCM firm with most similar size and momentum. Specifically, all non-financial, non-utility firms without GCM audit reports listed on the NYSE, AMEX or NASDAQ are first identified with a market value of equity between 70% and 130% of that of the sample firm. The control firm is then selected as that firm with momentum closest to that of the sample firm. Momentum is prior 11-month (t-12 to t-2) average raw returns.

| Month | Mean BHAR | t-value | Median BHAR | Wilcoxon z-value | Sign test z-value |
|---|---|---|---|---|---|
| 1 | -0.04 | -2.20 | -0.07 | -3.99 | -4.45 |
| 2 | -0.04 | -1.87 | -0.08 | -3.98 | -3.58 |
| 3 | -0.05 | -1.94 | -0.09 | -4.19 | -3.65 |
| 4 | -0.07 | -2.35 | -0.10 | -4.32 | -3.23 |
| 5 | -0.10 | -2.92 | -0.13 | -4.65 | -4.20 |
| 6 | -0.12 | -3.30 | -0.14 | -4.79 | -4.75 |
| 7 | -0.15 | -3.90 | -0.17 | -5.29 | -4.88 |
| 8 | -0.16 | -3.98 | -0.19 | -5.25 | -4.95 |
| 9 | -0.17 | -3.86 | -0.17 | -5.28 | -5.30 |
| 10 | -0.23 | -4.09 | -0.17 | -5.62 | -5.37 |
| 11 | -0.25 | -3.70 | -0.17 | -5.32 | -4.61 |
| 12 | -0.23 | -3.14 | -0.18 | -5.42 | -4.54 |

In table 6.6 I find that there is no significant difference between the negative momentum and positive momentum portfolios and am thus unable to reject the null hypothesis H9a. Mean (median) 12-month BHAR for negative momentum GCM firms (n=635) is -15% (-17%) and for positive momentum firms (n=210) is -21% (-19%). Similarly, to test for null hypothesis H9b using the control firm approach, my post-GCM drift results are unaffected. Table 6.7 show mean (median) 12-month BHARs are -23% (-18%), both significant at the 1% level. Based on these results

I reject the null hypothesis H9b and as such, the phenomenon of market underreaction to GCM (bad news) disclosures cannot be explained in terms of prior return continuation.[47]

### *6.2.5 Penny stocks status and the post-GCM drift*

Despite the apparent magnitude of my reported results, many of the firms in my sample have low market capitalisation and, in particular, low stock prices. Returns on such penny stocks could well be prone to measurement problems. Conrad and Kaul (1993) and Ball, Kothari, and Shanken (1995) suggest apparent long-term market overreaction may be driven by computational problems associated with the returns on low price "loser" stocks. To see whether such a low stock price status can explain my post-GCM drift I test the following hypothesis:

***H10: There is no difference in the returns of GCM firms and non-GCM firms with similar penny stock status.***

To test null hypothesis 10, I match my sample firms on a one-to-one basis with firms with the same stock price to provide an appropriate control portfolio. Specifically, for each GCM firm I search in the population of non-finance, non-utility industry, non-GCM firms employed above for closest stock price match on the last trading day of the calendar month immediately following the 10-K publication date.[48] BHAR control firm benchmark analyses are then rerun on this basis. Table 6.8 presents the results. I

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[47] This result is reinforced by noting the correlation coefficient between GCM firm prior 11-month raw returns (t = -12 to -2) and post-GCM month 12-month returns (t = 1 to 12) is only -0.04, not significantly different to zero at any conventional level.

[48] I do not match on market capitalisation as this is highly correlated with stock price. Mean (median) sample firm stock price at the end of the going-concern month is $1.92 ($1.12), with equivalent mean (median) control firm stock price of $2.11 ($1.21). As there is no statistically significant difference between the samples, I conclude that control firm matching problems does not bias my results.

find 12-month mean (median) BHARs of -18% (-18%), both significant at the 1% level. These findings indicate that my main results of market underreaction to GCM disclosures cannot be explained by any penny stock effect and therefore I reject the null hypothesis H10.[49]

**TABLE 6.8**
**First Time Going-concern Modified Audit Report Post-announcement Month Buy-and-hold Abnormal Returns Adjusted for Penny Stock Status**

This table presents buy-and-hold abnormal returns (BHARs) for my population of 845 non-finance, non-utility industry firms listed on the NYSE, AMEX and NASDAQ which published a going-concern modified audit report (GCM) for the first time between 01.01.1994 and 31.12.2002 adjusted for penny stock status. Returns earned by delisted firms are represented by the equivalent monthly return on the S&P 600 Small Cap. Index. The 12-month period reported commences on the first day of the month immediately following the going-concern modified audit report release month. This table provides mean and median BHARs derived from matching each GCM firm with a 'clean' control firm of same price.

The table is derived on the following basis. Each GCM firm in my population is matched with that non-financial, non-utility, non-GCM firm with most similar price. Specifically, all non-financial, non-utility firms without GCM audit reports listed on the NYSE, AMEX or NASDAQ are first identified with stock prices available at the end of the GCM month. The control firm is then selected as that firm with stock price closest to that of the sample firm.

| Month | Mean BHAR | t-value | Median BHAR | Wilcoxon z-value | Sign test z-value |
|---|---|---|---|---|---|
| 1 | -0.04 | -1.77 | -0.05 | -3.45 | -3.84 |
| 2 | -0.05 | -2.18 | -0.07 | -3.67 | -4.11 |
| 3 | -0.10 | -2.93 | -0.10 | -4.42 | -4.48 |
| 4 | -0.10 | -3.00 | -0.12 | -4.65 | -4.27 |
| 5 | -0.13 | -3.45 | -0.14 | -5.25 | -5.16 |
| 6 | -0.14 | -3.80 | -0.15 | -5.56 | -5.78 |
| 7 | -0.16 | -3.84 | -0.14 | -5.09 | -5.64 |
| 8 | -0.15 | -3.59 | -0.16 | -5.24 | -6.33 |
| 9 | -0.17 | -3.37 | -0.15 | -4.85 | -4.61 |
| 10 | -0.22 | -3.46 | -0.16 | -5.08 | -4.95 |
| 11 | -0.20 | -3.15 | -0.17 | -5.36 | -4.68 |
| 12 | -0.18 | -2.74 | -0.18 | -5.57 | -4.82 |

[49] Results are very similar to the above even if I restrict my analysis to GCM firms with stock price > $1.

### *6.2.6 Industry explanation for the post-GCM drift*

Finally, there exists a possibility that my post-GCM negative abnormal returns are concentrated in a particular industry also experiencing similar abnormal returns. To test for such an industry-specific explanation, I test the following hypothesis:

***H11: There is no difference in the returns of GCM firms and non-GCM firms operating in the same industry.***

To provide an appropriate test for H11, I match each of my GCM firms on industry, size and book-to-market with a non-GCM control firm from the set of firms employed in the original control firm analysis in section 3.2.2 above. First, I identify all the firms at the end of the GCM month with the same industry as the GCM firm using the 28 industry group definitions available on Kenneth French's online data library and then from this set of firms, I select a firm with market value of equity between 70% and 130% and closest book-to-market ratio.[50] Table 6.9 presents industry adjusted buy-and-hold abnormal returns. After controlling for industry the 12-month mean (median) BHARs are -12% (-18%), both significant at the 1% level, suggesting that my original findings of market underreaction to GCM disclosures presented in chapter 6 do not have an industry-specific explanation. This leads me to reject the null hypothesis H11.

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[50] Website address is http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/det_30_ind_port.html.

**TABLE 6.9**
**First Time Going-concern Modified Audit Report Post-announcement Month Buy-and-hold Abnormal Returns Adjusted for Industry**

This table presents buy-and-hold abnormal returns (BHARs) for my population of 845 non-finance, non-utility industry firms listed on the NYSE, AMEX and NASDAQ which published a going-concern modified audit report (GCM) for the first time between 01.01.1994 and 31.12.2002 adjusted for industry specific effects. Returns earned by delisted firms are represented by the equivalent monthly return on the S&P 600 Small Cap. Index. The 12-month period reported commences on the first day of the month immediately following the going-concern modified audit report release month. This table provides mean and median BHARs derived from matching each GCM firm with a 'clean' control firm of same industry, size and book-to-market ratio.

The table is derived on the following basis. Each GCM firm in my population is matched with that non-financial, non-utility, non-GCM firm with most similar size and book-to-market ratio operating in the same industry. Specifically, all non-financial, non-utility firms without GCM audit reports listed on the NYSE, AMEX or NASDAQ operating in the same industry as the GCM firm are first identified. Then from these set of firms a subset of firms is identified with a market value of equity between 70% and 130% of that of the sample firm. The control firm is then selected as that firm with closest book-to-market ratio to that of the sample firm.

| Month | Mean BHAR | t-value | Median BHAR | Wilcoxon z-value | Sign test z-value |
|---|---|---|---|---|---|
| 1 | -0.04 | -2.27 | -0.06 | -3.51 | -3.57 |
| 2 | -0.06 | -2.76 | -0.09 | -4.41 | -5.25 |
| 3 | -0.10 | -3.41 | -0.11 | -5.44 | -5.56 |
| 4 | -0.11 | -3.38 | -0.14 | -5.50 | -4.76 |
| 5 | -0.12 | -3.64 | -0.16 | -5.77 | -5.45 |
| 6 | -0.13 | -3.79 | -0.18 | -6.13 | -5.45 |
| 7 | -0.14 | -4.11 | -0.17 | -6.21 | -5.80 |
| 8 | -0.14 | -3.71 | -0.17 | -6.11 | -5.52 |
| 9 | -0.11 | -2.75 | -0.16 | -5.76 | -5.94 |
| 10 | -0.13 | -2.94 | -0.16 | -5.76 | -4.97 |
| 11 | -0.14 | -2.48 | -0.17 | -5.94 | -5.59 |
| 12 | -0.12 | -2.11 | -0.18 | -5.72 | -5.25 |

## 6.3. Summary

In this chapter I explore various possible explanations for market underreaction to going-concern modified audit report disclosures. The idea is to see if the post-GCM drift is distinct from explanations/phenomena already documented in the literature. I test for post-earnings announcement drift, size, distress risk, momentum, penny stock bias and industry-specific explanations for the market underreaction phenomenon.

Overall, I find that the post-GCM drift is distinct from all of the above-mentioned explanations. However, the underperformance of my sample firms is restricted to GCM firms with negative earnings surprise, consistent with the market focusing on earnings while ignoring the full implications of the GCM signal. In the next chapter I search for a limits to arbitrage explanation for the persistence of my post-GCM drift over the subsequent one year period. Additionally, I examine trading activities of different stockholder classes to explore how they change their holdings around the bad news event in my GCM firms.

# CHAPTER 7

# LIMITS TO ARBITRAGE AND INVESTOR STOCKHOLDING ACTIVITY

## 7.1. Introduction

In the previous chapter I demonstrated that market underreaction to bad news is a very robust phenomenon and this post-GCM drift cannot be explained by post-earnings announcement drift, size, momentum or other explanations. This chapter explores two very interesting and important issues. The first issue relates to limits to arbitrage arguments and tests whether the post-GCM market underreaction anomaly is explained in this way. The concept of limits to arbitrage is important because it stops rational arbitrageurs from trading and any systematic mispricing, if prevalent, is exposed. The second important issue investigates the trading behaviour of different classes of investors holding GCM firm stocks. Such an analysis is vital as it will highlight whether rational and naïve investors exhibit similar trading behaviours and will give us additional insights into who is actually trading at prices, as demonstrated in the previous two chapters, apparently inconsistent with the fundamentals. On the condition that no arbitrage opportunities exist, one expects rational investors to at least reduce their holdings in small distressed GCM firms in order to reduce their losses. Examining these issues can inform us of the circumstances where such inefficiencies (market underreaction to bad news) exist, uncovering evidence against the efficient market hypothesis.

This chapter is organised as follows: section 2 tests hypothesis H12 for the limits to arbitrage arguments, section 3 tests hypothesis H13 by examining the stockholding

patterns of different classes of investors holding GCM firm stock and section 4 summarises the chapter.

## 7.2. Market Frictions

An increasing number of papers are now reporting results consistent with the minimally rational markets paradigm (Rubinstein, 2001). In this sub-section I test the proposition whether underreaction to GCM disclosures can be explained by a limits to arbitrage argument. To find systematic mispricing a somewhat necessary condition is that arbitrage is limited and thus it cannot eliminate the mispricing completely (e.g., De Long et al., 1990a, b; Shleifer and Vishny, 1997; Barber, Shleifer and Vishny, 1998). This is because if arbitrage is abundant rational investors will quickly correct any erroneous investment decisions made by irrational (naïve) investors and pull prices towards fundamental values causing the markets to function in line with the efficient markets hypothesis. Chan, Frankel, and Kothari (2004) point out that small stocks exhibit characteristics of firms with limited arbitrage and future research might attempt to test for mispricing in such contexts. Interestingly, my GCM context presents an ideal opportunity to see if arbitrage opportunities are limited as I have shown that these firms are small in size (see table 5.2) and systematically underreact for a period of one year (see chapter 5). So, in order to examine a limits to arbitrage story I search for two potential explanations based on market frictions a) lack of trading activity, and b) high trading costs. Table 5.2 shows the average (median) GCM firm, despite its small size and extreme characteristics, trades on no fewer than 236 (252) of the 252 trading days in the year following the GCM month with mean (median) stock turnover trading levels of 179% (89%). These figures indicate that my

GCM firms are actively traded and have reasonable trading volume statistics. So a lack of trading story is not an explanation for my anomalous results.

Next, I turn to a potential trading costs explanation for my small size highly distressed GCM firms, which might cause the post-GCM drift to persist for a full year. If the presence of high trading costs makes it impossible for rational investors to profit from such an apparent arbitrage opportunity then I would expect market prices of these firms to remain out of line with their fundamental prices for a considerable period of time. Lesmond, Schill and Zhou (2004) in the case of momentum profits and Taffler, Lu, and Kausar (2004) for U.K. GCM firms, find that profit opportunities are illusory and after adjusting for a range of trading costs facing an arbitrageur, no profit can be made. To see if similar results hold for my U.S. GCM sample firms, I test the null hypothesis 12.

***H12: Arbitrageurs should not be able to profit from GCM firm underperformance after adjusting for transaction costs***

To explore this hypothesis I investigate the hypothetical profit an arbitrageur might be able to earn, after all trading costs, by exploiting any market underreaction to first-time going-concern news events in practice through a zero-investment strategy of going short by a notional $25,000 in each of my GCM stocks and long in matched non-GCM firms. Similar to Taffler, Lu, and Kausar (2004) I consider three classes of trading costs; a) bid-ask spread, b) stock borrowing costs, and c) trading commissions, of which the first is the most significant. Table 5.2 shows the magnitude of the bid-ask spread percentage for my GCM firms with mean (median) of 10.7% (8.5%) in the

year following the GCM announcement month. The equivalent mean (median) bid-ask spread percentage for the matched control firms for the same period is 10.4% (7.1%). From these percentages it seems unlikely that any significant profit can be earned, on average, even absent all other costs.

Before conducting simulations for a potential arbitrage strategy it is important to discuss short sale and trading commission costs. D'Avolio (2002) reports that although only 9% of stocks on the CRSP database have loan fees above 1% per annum these 'specials' (stocks with high lending fees) have a mean loan fee of 4.3% per annum. In my analysis, I use shorting costs of 4.3% for all my GCM firms below median market capitalisation and 1% for firms above the median market capitalisation figure. For commission costs I broadly follow Lesmond, Schill, and Zhou (2004), more specifically I use a 4% commission rate for stocks under $1.00 per share. For all other stocks, as my notional trading amount is greater than $20,000, I use a commission rate of 0.25% per transaction.[51]

Value weighting is not appropriate for my GCM firm sample, therefore, I notionally short $25,000 of shares in each of my GCM firms at the end of the GCM month (t=0) and invest the net proceeds in the equity of the respective control firm matched on size and book-to-market.[52] These positions are then maintained until t = 12 (6) when the process is reversed with the required number of the GCM firm shares purchased in the market to close the short position and the holding in the matched control firm sold.

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[51] I conduct my simulations on the assumption that these stocks can be shorted. D'Avolio (2002), however, finds that over 50% of stocks with prices below $5 in the CRSP database are impossible to short. It is difficult for me to speculate how many of my GCM stocks can actually be borrowed in practice, nevertheless, I re-run the simulations only on GCM firms with prices => $5 (n=70). Results are qualitatively similar to those reported below, strengthening my limits to arbitrage story.

[52] I consider $25,000 to be a sufficiently small amount not likely to cause downward price pressure.

All transactions take place at the respective bid and ask prices and take into account shorting and commission costs.

If the GCM firm is delisted, subsequent monthly returns are represented by the return on the S&P 600 Small Cap. Index. In such cases bid and ask prices are constructed using the respective firm's BHRR. For all the delisted firms, I first estimate the price by multiplying the original price at the end of GCM month (t=0) by the missing month's BHRR, then bid and ask prices are estimated using half the average bid-ask spread across all cases in the sample with available data. Where bid or ask prices are missing, but the stock is still trading, the respective prices are estimated as previously but using the original stock price in that month.

**TABLE 7.1**

## Illustrative Arbitrage Profits Earned from a Zero-investment Strategy of Shorting the Stocks of Firms with First Time Going-concern Modified Audit Reports

This table presents illustrative zero-investment strategy potential arbitrage profits based on shorting $25,000 of the equity of each stock in my population of 845 non-finance, non-utility industry firms listed on the NYSE, AMEX and NASDAQ which published a going-concern modified audit report (GCM) for the first time between 01.01.1994 and 31.12.2002 together with percentage returns. Mean and median portfolio results and other statistics are provided separately for the 6-month and 12-month investment periods commencing on the first day of the month immediately following the going-concern modified audit report release month. The table provides net arbitrage profits for the full population and their equivalent returns statistics separately.

Net profits are calculated on the basis of an arbitrageur shorting $25,000 of the equity of each GCM firm at t = 0 and investing the net proceeds in the equity of the matched control firm, keeping this position open for 12 (6) months then purchasing the same number of shares of the GCM stock in the market to close the short position and selling the holding in the control firm. All transactions take place at the respective bid and ask prices and take into account shorting and trading commission costs. Bid and ask quotations are taken from CRSP. In the case of missing quotations the respective prices are estimated using half of the average bid-ask spread for all cases with available data at that month end. Stock shorting costs are estimated as 4.3% per annum for firms under median market capitalisation and 1% for firms over the median market cap. For commission costs I use a 4% commission rate for stocks under $1.00 per share and 0.25% for the rest of my sample. In the case of delisted firms subsequent monthly returns are represented by the return on the S&P 600 Small Cap. Index but the respective positions are closed at t = 12 (t = 6) as for the other firms in my sample.

| | Profit Statistics ($) | | Return Statistics (%) | |
|---|---|---|---|---|
| | 6-month | 12-month | 6-month | 12-month |
| Mean profit ($) | -4398 | -4969 | -0.18 | -0.20 |
| t-value | -2.21 | -1.77 | -2.21 | -1.77 |
| Median profit ($) | 111 | 1331 | 0.00 | 0.05 |
| Wilcoxon z-value | 1.63 | 0.37 | 1.65 | 0.37 |
| Sign z-value | 0.07 | 1.72 | 0.14 | 1.69 |
| Standard deviation($) | 57773 | 81769 | 2.31 | 3.27 |
| 25th percentile ($) | -12672 | -14914 | -0.51 | -0.60 |
| 75th percentile ($) | 9476 | 14296 | 0.38 | 0.57 |

Table 7.1 provides the hypothetical zero-investment arbitrage profits for post-GCM periods of 6 and 12 months for my full sample. On an investment of $25,000 per firm mean 12-month (6-month) losses are $4,969 ($4,398); results are significant at the1% (10%) level. On the other hand, the story differs somewhat for my median results: 12-

month (6-month) median profits are $1,331 ($111). Only the Fisher sign test is significant (at the 10% level) for the 12-month result and only the Wilcoxon signed-rank test is significant (at the 10% level) for the 6-month result. Standard deviations and inter-quartile ranges are also high. Table 7.1 also provides the equivalent average returns statistics. Based on these results it is probably more appropriate to conclude that the trading costs incurred in implementing such an arbitrage strategy are likely to wipe out any potential profits that might apparently be earned, evidence which is consistent with the null hypothesis H12. Therefore, I conclude that the risk of investing in my GCM stocks is high and it may not be feasible for a rational investor to take such a risk by arbitraging such small highly distressed stocks. This implies that arbitrage is limited and rational investors (professional arbitrageurs) have limited incentives to trade in these small stocks because of high costs against those (naïve) investors who are unable to deal rationally with the pessimistic information conveyed by the GCM event. This causes the prices to deviate systematically from those predicted under the efficient market hypothesis. The next sub-section, explicitly explores whether there are any potential differences in trading behaviours among professional and naïve investors.

## 7.3. Trading Activity of Different Stockholder Groups

My results in chapters 5 and 6 demonstrate that the market in aggregate underreacts to the bad news relating to a firm's future prospects conveyed by a going-concern opinion. To test hypothesis H13, I explore whether institutional investors and retail investors exhibit similar trading biases. More specifically, I examine the stock holding and trading patterns of institutions and insiders, and by deduction retail investors, in my GCM sample firms. Such an investigation is useful because it will help us make

inferences about who is actually trading in these stocks, given the reasonable level of trading volume presented in table 5.2. If institutional investors do not reduce their holdings in firms with going-concern opinions then it can be speculated that such biases are not limited to naïve investors only.[53]

***H13: There should be no difference in holding patterns of various stockholder classes in GCM (bad news) stocks over time.***

To test H13 I examine the holding patterns of the three classes of stockholder (institutions, insiders, and by deduction retail investors) from one year prior to one year after the GCM audit report publication quarter. Insider holdings data are available on a period-by-period basis and can be transformed into monthly holdings, whereas institutional holdings data are only available on a quarterly basis. Therefore, I conduct my analysis on a quarterly basis. Insider data are available for all my sample firms but institutional data are only available for 801 of my 845 GCM firms. Not every firm has data available in every month or quarter.

I analyse stock holding data for 9 quarters (4 pre-event quarters, GCM quarter and 4 post-event quarters) and use this data to calculate quarterly changes in holdings. These change in holdings statistics are then used to calculate the percentage contribution of insider trades, institutional trades and by deduction trades of retail investors to the total volume of shares traded in each quarter. Specifically, I use the following formula to calculate the percentage contribution statistics:

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[53] Recent evidence suggests that small traders (individuals) are less sophisticated users of information, whereas large traders (institutions) are more informed and therefore more rational (see Bhattacharya, 2001; Bhattacharya, Black, Christensen, and Allee, 2003; and Bhattacharya, Black, Christensen, and Mergenthaler, 2004).

$$\% TRD_{ij} = (|\Delta QTRHOLD_{ij}| * AVGSHROUT_j) / VOL_i \quad (7)$$

where % $TRD_{ij}$ = percentage contribution of market participant class j's trades to total trades for firm i, $|\Delta QTRHOLD_{ij}|$ = absolute change in quarterly holdings in firm i by market participant class j, $AVGSHROUT_i$ = number of shares outstanding calculated as the monthly average in that quarter for firm i, $VOL_i$ = total quarterly trading volume for firm i, and j = 1 if institutional holdings, 2 if insider (board) holdings.

The above statistics are computed for all firms with available data. Where such data are available for both insiders and institutions, I sum the percentages to determine their aggregate contribution to total trading volume. Subtracting this total from 100% for each GCM firm enables us to deduce the percentage contribution of retail (naïve) investors to total trading volume. This gives us some idea of who is actually responsible for the majority of the trades in the shares of my GCM firms.

Panels A and B of Table 7.2 presents the mean percentage holdings and percentage contribution of trades by insiders, institutions and retail investors for the 9 quarters. I find that institutional holdings decline from 17% in the 4th quarter prior to the GCM quarter to about 11% in that quarter. Any significant decline is not seen in the 4 quarters following the GCM quarter. In contrast, insider holdings do not change significantly over the two year period, averaging around 15%.[54]

[54] To see whether my results are driven by GCM firms with infrequent holding data I only use those GCM firms that have both institutional and insider holding data available in all the 9 quarters under study. Results are qualitatively similar to those reported above and are presented in appendix 4.

**TABLE 7.2**

## First Time Going-concern Modified Audit Report Insider and Institutional Holding Patterns and Trading Activity Percentages

This table presents mean and median percentage institutional, insider, and, by deduction, retail holding patterns and their associated percentage contribution to total trading volume for my 845 first-time going-concern audit report (GC) non-finance, non-utility industry firms listed on the NYSE, AMEX or NASDAQ with such audit opinions published between 01.01.94 and 31.12.2002. Results for 9 quarters are provided, four quarters prior to the GC quarter, four quarters subsequent to, and the GC quarter itself (0). Total numbers of cases with available data in each quarter are also shown. Panel A presents holding statistics, while Panel B presents trading percentages for the three stockholder classes. Retail holding and trading percentages are calculated by subtracting the respective institutional and insider percentages for those stocks, where the relevant percentage figures are available, from 100%.

**Panel A: Holdings**

| Quarter | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|
| *Institutional* | | | | | | | | | |
| Mean (%) | 16.7 | 15.2 | 13.8 | 12.9 | 11.1 | 10.3 | 9.7 | 10.7 | 10.7 |
| Median (%) | 10.6 | 9.3 | 7.9 | 7.7 | 6.3 | 5.1 | 4.6 | 4.7 | 4.3 |
| N | 579 | 601 | 613 | 626 | 653 | 620 | 507 | 408 | 357 |
| *Insider* | | | | | | | | | |
| Mean (%) | 14.2 | 14.2 | 14.2 | 14.4 | 15.2 | 15.5 | 15.5 | 15.5 | 15.2 |
| Median (%) | 9.7 | 9.3 | 9.6 | 9.8 | 10.4 | 10.4 | 10.2 | 10.1 | 10.2 |
| N | 721 | 737 | 744 | 751 | 752 | 697 | 576 | 481 | 420 |
| *Retail (by deduction)* | | | | | | | | | |
| Mean (%) | 68.8 | 69.9 | 71.3 | 72.2 | 73.6 | 73.8 | 73.9 | 73.3 | 72.4 |
| Median (%) | 72.3 | 72.7 | 74.3 | 75.7 | 77.6 | 78.3 | 79.1 | 78.7 | 78.2 |
| N | 516 | 543 | 555 | 566 | 588 | 562 | 462 | 380 | 328 |

**Table 7.2 cont...**

**Panel B: Trading percentages**

| Quarter | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|
| *Institutional* | | | | | | | | | |
| Mean (%) | 11.2 | 11.7 | 12.0 | 10.5 | 9.6 | 11.4 | 12.9 | 8.2 | 9.4 |
| Median (%) | 4.8 | 5.3 | 5.7 | 4.1 | 4.3 | 5.0 | 3.9 | 2.7 | 3.5 |
| N | 532 | 572 | 595 | 612 | 625 | 564 | 415 | 290 | 232 |
| *Insider* | | | | | | | | | |
| Mean (%) | 5.3 | 5.1 | 4.4 | 4.5 | 5.1 | 6.2 | 5.1 | 5.7 | 5.8 |
| Median (%) | 0.5 | 0.3 | 0.3 | 0.3 | 0.4 | 0.1 | 0.1 | 0.2 | 0.4 |
| N | 685 | 714 | 733 | 743 | 751 | 655 | 472 | 348 | 282 |
| *Retail (by deduction)* | | | | | | | | | |
| Mean (%) | 83.5 | 83.5 | 84.0 | 85.1 | 85.4 | 83.6 | 82.7 | 85.9 | 85.3 |
| Median (%) | 90.5 | 91.5 | 90.9 | 92.7 | 93.2 | 91.4 | 92.0 | 92.8 | 92.7 |
| N | 468 | 510 | 537 | 554 | 565 | 509 | 373 | 266 | 210 |

Importantly, Panel B suggests that most of the trading in my GCM firms is conducted by retail investors. Institutions, on average, account for about 11% of total trades and insiders about 5%. The remaining 84% of trading volume, by deduction, is accounted for by retail investors. There is also some evidence of an increase in trading activity by insiders and institutions after the GCM announcement, especially in the two quarters after the GCM quarter. Institutional percentage trading activity increases to 13% and that by insiders to 6%, with institutions appearing to reduce their holdings slightly and, if anything, insiders increasing theirs.

To shed additional light on the investment behaviour of my three classes of stockholder and test whether investors react more strongly to more acute adverse potential outcomes, I examine their holding patterns over time conditional on GC firm ex post outcomes. I expect rational investors to sell down their holdings in firms with more severe GC uncertainty resolutions in a timely fashion. Table 7.3 breaks down the institutional, insider and retail (by deduction) trading patterns depending on whether the GC firm in the following year enters bankruptcy or is delisted (Panel A), is given a further GC opinion or is acquired (Panel B), or receives a clean audit report (GC withdrawn) (Panel C).[55]

[55] Using the control firm approach (table 4.2), mean 12-month BHAR for firms that subsequently enter bankruptcy or are delisted is -58% (p=0.000) (n=375), for firms that are given a further GC opinion or are acquired is -7.4% (p=0.364) (n=348), and for firms that subsequently receives a clean audit report is 86% (p=0.003) (n=122).

**TABLE 7.3**

## First Time Going-concern Modified Audit Report Insider and Institutional Holding Patterns Conditional on Ex Post Outcomes

This table presents mean and median percentage institutional, insider and, by deduction, retail holding patterns conditional on ex post outcome for my 845 first-time going-concern audit report (GC) non-finance, non-utility industry firms listed on the NYSE, AMEX or NASDAQ with such audit opinions published between 01.01.1994 and 31.12.2002. Results for 9 quarters are provided, four quarters prior to the GC quarter, four quarters subsequent to, and the GC quarter itself (0). Total numbers of cases with available data in each quarter are also shown. Panel A presents holding statistics for bankrupt or delisted GC firms, Panel B provides similar statistics for continuing GC and acquired GC firms, and Panel C for firms with GC subsequently withdrawn.

**Panel A: Holdings in bankrupt or delisted firms**

| Quarter | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|
| *Institutional* | | | | | | | | | |
| Mean (%) | 16.7 | 15.1 | 13.3 | 12.0 | 9.4 | 7.8 | 6.5 | 5.7 | 5.3 |
| Median (%) | 10.1 | 9.0 | 7.6 | 7.2 | 5.0 | 3.7 | 2.5 | 1.9 | 1.3 |
| N | 289 | 305 | 312 | 322 | 346 | 297 | 188 | 94 | 41 |
| *Insider* | | | | | | | | | |
| Mean (%) | 14.4 | 14.5 | 14.4 | 14.7 | 15.7 | 15.7 | 15.9 | 14.7 | 13.6 |
| Median (%) | 10.8 | 10.5 | 10.4 | 10.2 | 10.7 | 11.0 | 10.1 | 9.4 | 5.6 |
| N | 313 | 321 | 326 | 327 | 327 | 276 | 171 | 89 | 37 |
| *Retail (by deduction)* | | | | | | | | | |
| Mean (%) | 69.4 | 70.7 | 72.9 | 73.5 | 74.8 | 76.7 | 78.1 | 73.5 | 82.7 |
| Median (%) | 75.3 | 75.4 | 79.0 | 78.7 | 80.5 | 81.8 | 83.1 | 79.5 | 82.3 |
| N | 244 | 260 | 270 | 279 | 300 | 214 | 86 | 23 | 3 |

**Table 7.3 cont...**

Panel B: Holdings in continuing GC or acquired firms

| Quarter | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|
| *Institutional* | | | | | | | | | |
| Mean (%) | 16.0 | 14.9 | 14.0 | 13.4 | 12.5 | 11.9 | 10.7 | 10.9 | 9.8 |
| Median (%) | 10.2 | 9.2 | 7.5 | 7.2 | 6.9 | 6.5 | 5.6 | 5.3 | 4.2 |
| N | 219 | 225 | 229 | 231 | 232 | 243 | 235 | 225 | 225 |
| *Insider* | | | | | | | | | |
| Mean (%) | 14.8 | 14.6 | 14.6 | 14.3 | 14.9 | 15.6 | 16.1 | 16.6 | 16.2 |
| Median (%) | 9.0 | 8.9 | 9.4 | 9.7 | 10.3 | 10.6 | 10.9 | 11.9 | 10.8 |
| N | 300 | 306 | 308 | 311 | 312 | 308 | 291 | 278 | 268 |
| *Retail (by deduction)* | | | | | | | | | |
| Mean (%) | 69.1 | 70.5 | 71.2 | 72.5 | 73.3 | 73.9 | 73.9 | 73.7 | 74.6 |
| Median (%) | 72.9 | 73.7 | 75.0 | 75.5 | 77.6 | 77.8 | 80.1 | 79.0 | 80.2 |
| N | 191 | 197 | 202 | 206 | 208 | 215 | 192 | 175 | 171 |

Panel C: Holdings in GC withdrawal firms

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| *Institutional* | | | | | | | | | |
| Mean (%) | 18.3 | 17.0 | 15.7 | 15.7 | 15.0 | 14.6 | 14.3 | 15.7 | 15.2 |
| Median (%) | 13.5 | 12.5 | 12.4 | 12.5 | 10.8 | 10.3 | 7.7 | 7.4 | 7.1 |
| N | 71 | 71 | 72 | 73 | 75 | 80 | 84 | 89 | 91 |
| *Insider* | | | | | | | | | |
| Mean (%) | 11.9 | 12.3 | 12.6 | 13.7 | 14.3 | 14.6 | 13.4 | 13.3 | 13.5 |
| Median (%) | 8.5 | 7.2 | 7.0 | 7.7 | 8.3 | 8.2 | 8.1 | 8.0 | 7.9 |
| N | 108 | 110 | 110 | 113 | 113 | 113 | 114 | 114 | 115 |
| *Retail (by deduction)* | | | | | | | | | |
| Mean (%) | 68.7 | 69.8 | 71.5 | 71.8 | 71.8 | 71.1 | 71.5 | 70.9 | 69.8 |
| Median (%) | 72.8 | 72.7 | 73.4 | 73.6 | 74.8 | 74.9 | 76.8 | 78.8 | 77.3 |
| N | 64 | 65 | 66 | 69 | 71 | 76 | 81 | 86 | 88 |

Panel A (bankruptcy or delisting) demonstrates that, on average, institutional holdings decline from 16.7% to 5.3% over the two year period around the GC event, whereas, retail holdings increase from 69.4% to 82.7%. Panel B (continuing GC or acquisition) also shows a similar trend with a decline in institutional holdings (from 16% to 9.8%) and an increase in retail holdings (from 69.1% to 74.6%). However, Panel C (GC withdrawal firms) shows no significant change in holdings over the 9 quarters for either institutions or retail investors. Insider holdings do not change materially in any panel. Overall, these results show that institutions trade rationally by ex ante reducing their holdings in stocks with the most adverse outcomes. However, exactly the opposite behaviour is observed in the case of retail investors.

From the above analysis it seems that institutional investors are less prone to behavioural trading biases in the processing of this extreme bad news event in contrast to retail investors.[56] My evidence of stock mispricing and extended post-GC drift might then be explained by a limits to arbitrage argument with naïve (retail) investors keeping stock prices artificially high by trading inappropriately in these stocks due to their behavioural biases. My results do not support Taffler, Lu, and Kausar's (2004) speculative argument that professional investors suffer from similar error processing biases in their U.K.-based GC firm results. These results are inconsistent with null hypothesis H13 and clearly show that there is a class of investors who do not act rationally in this financial distress context.

[56] Although, it is also possible that institutional investors are forced to reduce their holdings in such small distressed stocks because of certain constraints in their investment mandates (for e.g., reduction of holdings due to bond downgrades or fall of stock price below a certain level etc.)

## 7.4. Summary

This chapter set out to evaluate whether profit opportunities exist to trade on the market underreaction to GCM anomaly. In addition, this chapter also explores the behaviour of various classes of GCM firm stockholder in the two year period surrounding the publication of going-concern modified audit report disclosures.

The results demonstrate that high transaction costs are associated with my GCM firms and after adjusting for these costs it is not possible for arbitrageurs to profit from the post-GCM drift anomaly. A net zero-investment strategy appears to be very risky for rational investors. Although, these market frictions could be a reason for the persistence of my strong post-GCM announcement drift, they cannot explain the existence of this drift in the first place, and its asymmetric nature as shown in chapter 5.

To explore further potential reasons for market underreaction to going-concern modified opinions, I examine the trading patterns of different investor classes in response to the going-concern opinion; I find that institutional holdings in GCM firms decline by around 35% over the 9-quarter period centred on the GCM announcement quarter from 17% to 11%. In contrast, insider holdings do not change significantly, averaging around 15% throughout. By deduction, retail investors would appear to increase their holdings over this period in these stocks from around 68% to 74%. Furthermore, they account for most of the trading activity. When I analyse the trading activity of the three classes of stockholders based on ex post outcome, I find institutions, on average, reduce their holdings substantially in the GCM bankruptcy or delisting stock category (17% to 5%), whereas, by deduction retail investors appear to

increase their holdings in these stock (70% to 83%) over the 9-quarter period. Insider holdings do not change significantly over the two-year period surrounding the GCM event. On this basis, I have evidence that institutional investors are less prone to behavioural biases in assimilating bad news of this nature. This shows that there is a class of investors who do not seem to rationally incorporate the implications of bad news while making their investment decisions. My evidence of stock mispricing and extended post-GCM-drift might then be explained by a limits-to-arbitrage argument with naïve (retail) investors, being particularly prone to behavioural bias, keeping stock prices artificially high by trading inappropriately in these stocks. My results do not support Taffler, Lu, and Kausar's (2004) speculative argument that professional investors suffer from similar error processing biases in their U.K.-based GCM firm results and are consistent with a broader set of studies that find institutional investors are more informed and therefore more rational (Grinblatt and Keloharju, 2000, 2001a, 2001b).

The last three chapters of my thesis, including this one, investigate the market underreaction anomaly thoroughly in the U.S. by using going-concern audit report disclosures as my bad and good news events in the financial distress domain. My empirical findings suggest that investors underreact to GCM (bad news) disclosures while fully anticipate good news as highlighted by the publication of the GCM withdrawn audit report. Market underreaction to bad news cannot be explained by post-earnings announcement drift, size, distress risk, momentum, penny stock and industry explanations. In the next chapter, I examine the impact of different bankruptcy regimes on investor response to the GCM bad news signal in the U.S. and

the U.K. to study the informativeness of accounting information conditional on the local bankruptcy code of the institutional environment.

# CHAPTER 8

# THE IMPACT OF BANKRUPTCY CODES AND MARKET RESPONSE TO GCM DISCLOSURES

## 8.1. Introduction

The ongoing debate and discussions surrounding the informativeness of the going-concern and other subject-to opinions date back several decades to the late 1970s when the Auditing Standards Committee first attempted to remove the subject-to opinion option, including that issued for going-concern uncertainties. Financial statement users responded adversely to this proposal because they believed that the audit opinion contained important information (Mutchler, 1985; Campbell and Mutchler, 1988). However, early market studies suggested that audit qualifications provide little or no new information to investors (e.g., Elliott, 1982; Dodd et al., 1984; Dopuch et al., 1986; Dopuch et al., 1987). Some authors even argued that the audit opinion, in particular the going-concern opinion, was merely a transformation of publicly available information (Mutchler, 1985; Dopuch et al, 1987). More recent studies, on the other hand, are consistent with the audit opinion in fact having information content (Loudder et al., 1992; Fleak and Wilson, 1994; Blay and Geiger, 2001). Despite these unresolved issues, the evidence in the literature documenting the value of the audit opinion to investors is relatively scarce (Healy and Palepu, 2001). In the previous chapters, I have shown that going-concern modified audit reports have longer-term price impact and thus have some information content. Additionally, Taffler, Lu, and Kausar (2004) present similar findings for the U.K. but it seems that the market response in the U.K. is far more negative than what I find in the U.S. for a similar time-frame.

In this chapter, I examine the information content of the going-concern opinion issued by auditors in the U.S. and in the U.K. in the short and longer-run. The purpose is to provide evidence on the effect of the interaction of local bankruptcy codes with a similar information signal (the auditor's going-concern opinion) indicating an increase in financial distress on security prices in the U.S. and the U.K.. As mentioned in section 2.6 of chapter 2, the U.S. is biased more towards the rights of debtors, whereas the U.K. is biased more towards the rights of creditors. In the U.K., the going-concern auditing regime under SAS 600 (APB, 1993) and SAS 130 (APB, 1994) is based on, and is very similar to, SAS No. 58 (AICPA, 1988a) and SAS No. 59 (AICPA, 1988b) with equivalent auditing standards and procedures. Furthermore, various studies in the corporate governance area point out that the U.S. and the U.K. have very similar capital market structures (i.e., large number of public firms, dispersed ownership, important role of institutional investors and managers holding significant equity stakes with high discretionary power etc.) and are classified as market-centred systems (see e.g., Allen and Gale, 2000). This discussion points to the fact that there are major similarities between the U.S. and the U.K. institutional environments in this context and the only notable difference is in their respective bankruptcy regimes. Hence, a U.S.-U.K. comparison provides a natural experiment to examine how a very similar information cue produced by the accounting system can have differential information content potentially because of the strikingly different bankruptcy codes in these two countries. I hypothesise that, despite the relative uniformity of the auditor's going-concern opinion across the two countries, investors would react more adversely to the GCM signal in a creditor-friendly institutional environment (i.e., the U.K.) than in a debtor-friendly environment (i.e., the U.S.).

The chapter is organised as follows: section 2 presents the descriptive statistics for my U.S. and U.K. GCM firm sample, section 3 reports the results of the hypotheses, section 4 provides additional robustness tests and section 5 summarises the results.

## 8.2. Descriptive Statistics of the U.S. and U.K. GCM Sample

Table 8.1 Panel A provides the proportion of bankrupt firms receiving going-concern modified audit reports in their last financial statements prior to entering bankruptcy for U.S. and U.K. GCM firms. Over the period 1995-2002, approximately 41% of all bankrupt firms in the U.S. received a GCM in their last 10-K prior to entering bankruptcy. This percentage is slightly lower in the U.K. (35%), although not significantly so ($p=0.24$). Panel B of Table 8.1 summarises the proportions of GCM firms that subsequently enter bankruptcy within one year in the U.S. and U.K. Over the period 1995-2002, there is no significant difference between the percentage of U.S. firms entering bankruptcy with GCMs (16%) and the percentage of U.K. GCM firms entering bankruptcy (14%) ($p=0.17$). Although, these statistics do not differ significantly between debtor-friendly and creditor-friendly regimes over my sample time-period, on average 4.1% of U.S. firms had GCM audit reports each year, in contrast to 2.4% in the U.K. ($p=0.00$). This is consistent with the expectation that auditors in the U.K. may be more reluctant to issue GCMs because the implications of a GCM to investors are more severe (compared to the U.S.).

## TABLE 8.1
## Going-concerns and Bankruptcies

Panel A presents on an annual basis the number of public firms with going-concern modified (GCM) audit reports that went bankrupt as a percentage of total bankruptcies from 1995 to 2002 in the U.S. and in the U.K. In the case of the U.S., bankruptcies reported in the table relate to non-finance, non-utility, industry firms traded on the NYSE, AMEX or NASDAQ and for the U.K. these are non-financial firms traded on the London Stock Exchange or the Unlisted Securities Market.

**Panel A: Proportion of public firms bankruptcies with a prior GCM to total bankruptcies**

| | United States | | | United Kingdom | | | |
|---|---|---|---|---|---|---|---|
| Year | Total bankruptcies | Bankruptcies with GCM audit reports | % | Total bankruptcies | Bankruptcies with GCM audit reports | % | Difference in proportions (p-value) |
| 1995 | 39 | 11 | 28 | 11 | 5 | 45 | 0.28 |
| 1996 | 39 | 14 | 36 | 7 | 3 | 43 | 0.72 |
| 1997 | 35 | 17 | 49 | 12 | 6 | 50 | 0.93 |
| 1998 | 64 | 18 | 28 | 14 | 6 | 43 | 0.28 |
| 1999 | 81 | 39 | 48 | 9 | 1 | 11 | 0.04 |
| 2000 | 97 | 33 | 34 | 5 | 1 | 20 | 0.52 |
| 2001 | 169 | 73 | 43 | 15 | 5 | 33 | 0.46 |
| 2002 | 117 | 60 | 51 | 16 | 4 | 25 | 0.05 |
| | 641 | 265 | 41 | 89 | 31 | 35 | 0.24 |

## TABLE 8.1 - Continued

Panel B presents on an annual basis the number of public firms with going-concern modified (GCM) audit reports that went bankrupt as a percentage of total number of firms with first-time and continuing GCM audit reports from 1995 to 2002 in the U.S. and in the U.K. In the case of the U.S., GCMs reported in the table relate to non-finance, non-utility, industry firms traded on the NYSE, AMEX or NASDAQ and for the U.K. these are non-financial firms traded on the London Stock Exchange or traded on the Unlisted Securities Market. Bankrupt cases with GCMs are defined similarly.

**Panel B: Proportion of public company bankruptcies with a prior GCM to total GCM firms**

| | United States | | | United Kingdom | | | |
|---|---|---|---|---|---|---|---|
| Year | Total GCM firms | Bankruptcies with GCM audit reports | % | Total GCM firms | Bankruptcies with GCM audit reports | % | Difference in proportions (p-value) |
| 1995 | 124 | 11 | 9 | 32 | 5 | 16 | 0.26 |
| 1996 | 142 | 14 | 10 | 38 | 3 | 8 | 0.71 |
| 1997 | 227 | 17 | 7 | 31 | 6 | 19 | 0.03 |
| 1998 | 245 | 18 | 7 | 32 | 6 | 19 | 0.03 |
| 1999 | 198 | 39 | 20 | 33 | 1 | 3 | 0.02 |
| 2000 | 176 | 33 | 19 | 25 | 1 | 4 | 0.07 |
| 2001 | 235 | 73 | 31 | 16 | 5 | 31 | 0.98 |
| 2002 | 225 | 60 | 27 | 26 | 4 | 15 | 0.21 |
| | 1572 | 265 | 16 | 233 | 31 | 14 | 0.17 |

Table 8.2 Panel A presents the descriptive statistics for my U.S. and U.K. GCM firm samples. Based on the U.S. dollar/U.K. pound exchange rate at the GCM date, firm size (measured by mean market capitalisation and total assets) is similar between U.S. GCM firms and U.K. GCM firms (p=0.56 and p=0.81, respectively). However, U.K. GCM firms tend to exhibit considerably greater decline in earnings during the year of the GCM (CHEAR). The mean and median changes in earnings for U.K. firms are -38% and -45% compared to -28% and -23% for U.S. firms, respectively. I also observe that U.K. GCM firms tend to be more financially distressed as measured by PRZ with mean a of 0.88 compared with a mean of 0.80 for U.S. firms (p=0.00).[57] Finally, there are no significant differences between U.S. and U.K. GCM firms in terms of leverage, book-to-market and momentum.

Panel B of Table 8.2 shows that 82% of U.S. GCM firms have positive equity compared with 76% of U.K. GCM firms; this difference in proportion is marginally significant (p=0.10). On the other hand, only 2% of the U.S. GCM firms have positive EPS compared to 14% in the U.K. (p=0.00). U.S. GCM firms are twice as likely to pay a dividend (DIVID) as U.K. GCM firms (24% v 13%) (p=0.00) and also three times more likely to be delisted (DEAD) than U.K. GCM firms (45% v 15%) (p=0.00) but the percentages of U.S. and U.K. GCM firms that are acquired (ACQU) are similar (6% v 7%). Firms in both countries are equally likely to hire a quality auditor (i.e., more credible) and also have similar GCM firm percentages where a GCM is expected.

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[57] PRZ is derived by transforming each GCM firm z-score into the respective U.S./U.K. population-relative z-score (PRZ) based on population z-score percentiles. Thus PRZ ranges from 0 to 1; the higher the score, the higher the probability of bankruptcy. This is done to make the z-scores directly comparable across the two countries as Altman (1968) and Taffler (1984) have different z-score scales and cut-off points.

## TABLE 8.2
## Descriptive Statistics

This table presents summary statistics relating to my population of 823 non-finance, non-utility, industry firms traded on the NYSE, AMEX or NASDAQ receiving first-time going-concern modified (GCM) audit reports between 01.01.1995 and 31.12.2002 in the U.S., and 127 non-finance industry firms traded on the London Stock Exchange or Unlisted Securities Market receiving first-time going-concern modified audit reports between 01.1.01995 and 31.12.2002 in the U.K.. Panel A reports continuous financial variables along with differences in mean (median) GCM firm characteristics between the two bankruptcy regimes and Panel B reports other firm characteristics.

**Panel A: Continuous Variables**

| | United States (n=823) | | | United Kingdom (n=127) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Variable | Mean | Median | St. dev. | Mean | Median | St. dev. | Mean difference | p-value | Median difference | p-value |
| SIZE | 33.86 | 12.25 | 134.88 | 41.18 | 8.71 | 92.62 | -7.32 | 0.56 | 3.53 | 0.31 |
| TA | 154.83 | 20.28 | 1307.13 | 126.68 | 26.68 | 548.65 | 28.15 | 0.81 | -6.40 | 0.37 |
| CHEAR | -0.28 | -0.23 | 0.50 | -0.38 | -0.45 | 0.61 | 0.10 | 0.03 | 0.12 | 0.01 |
| PRCHEAR | 31.84 | 22.51 | 28.59 | 24.02 | 8.36 | 33.36 | 7.82 | 0.01 | 14.15 | 0.00 |
| PRZ | 0.80 | 0.87 | 0.21 | 0.88 | 0.94 | 0.20 | -0.07 | 0.00 | -0.07 | 0.00 |
| LEV | 0.46 | 0.37 | 0.49 | 0.45 | 0.37 | 0.42 | 0.01 | 0.75 | 0.00 | 0.67 |
| BM | 0.80 | 0.38 | 2.46 | 0.55 | 0.32 | 3.20 | 0.25 | 0.31 | 0.05 | 0.55 |
| MOM | -0.04 | -0.04 | 0.09 | -0.03 | -0.03 | 0.09 | -0.01 | 0.10 | -0.01 | 0.14 |

SIZE = market value measured by market capitalisation in $ million at the end of the calendar month of audit report publication date, TA = total assets less intangibles in $ million, CHEAR = annual change in earnings, PRCHEAR = percentile based population relative annual change in earnings, PRZ = population relative financial distress measure computed using Altman (1968) for U.S. firms and Taffler (1984) for U.K. firms, LEV = leverage proxy defined as total debt/total assets, BM = book value of assets divided by market capitalisation at the end of the calendar month of audit report publication date, and MOM = monthly average of prior 11-months (t-12 to t-2) raw returns. U.K. firm statistics are converted into dollar values using U.S. dollar/U.K. pound exchange rates as at the GCM event date.

**TABLE 8.2 - Continued**

**Panel B: Other Variables**

| | United States (n=823) | | United Kingdom (n=127) | | |
|---|---|---|---|---|---|
| Variable | Number of positive cases | % of sample | Number of positive cases | % of sample | Difference in proportions (p-value) |
| EQUITY | 673 | 81.8 | 96 | 75.6 | 0.10 |
| EPS | 20 | 2.4 | 18 | 14.2 | 0.00 |
| DIVID | 204 | 24.8 | 16 | 12.6 | 0.00 |
| DEAD | 371 | 45.1 | 19 | 15.0 | 0.00 |
| ACQU | 51 | 6.2 | 9 | 7.1 | 0.70 |
| AUDITOR | 621 | 75.5 | 93 | 73.2 | 0.59 |
| PREDGC | 413 | 50.2 | 64 | 50.4 | 0.97 |

EQUITY = book value of equity dummy (1 if positive, 0 otherwise), EPS = EPS dummy (1 if positive EPS, 0 otherwise), DIVID = dividend paid dummy (1 if dividend paid, 0 if nominal or omission), DEAD = delisting dummy (1 if the firm enters into bankruptcy or is otherwise delisted within one year of the audit report date, 0 otherwise), ACQU = acquired dummy (1 if the firm is acquired within one year of the audit report date, 0 otherwise), AUDITOR = audit quality proxy dummy (1 if Big5/Big6, 0 otherwise) and PREDGC = GCM expectations dummy calculated using Mutchler (1983) for U.S. and Citron and Taffler (2001) for U.K. (1 if GCM expected, 0 otherwise).

## 8.3. Test of Hypotheses

In this section, I conduct formal tests of hypotheses 14 and 15 discussed in chapter 3. The basic idea is to see if investors in the U.K. respond more adversely to the GCM signal than investors in the U.S because of the extreme differences in the underlying bankruptcy codes of the two regimes. For this purpose I test these null hypotheses in the short-run as well as longer-run. As discussed in chapter 3 there are problems with short-term event studies in the GCM context (e.g. Bailey, 1982), I provide these results for completeness. Based on this premise, I test the following null hypotheses in short-term and longer-term in a univariate as well as a multivariate setting.

***H14: There is a no negative market reaction to the auditor's going-concern modified opinion at the time the opinion is announced.***

***H15: The negative market reaction to the auditor's going-concern modified opinion is no greater in the U.K. than in the U.S.***

### *8.3.1. Univariate Results – Short window*

To test null hypotheses 14 and 15 in the short-term in a univariate setting, table 8.3 Panel A presents the daily abnormal returns for the 21-day window, ($t=-10$ to $t=+10$) surrounding the GCM announcement date ($t=0$) for both the U.S and U.K. firms and Panel B presents the CARs over the windows [-10,-2], [-1,0], [-1, +1] and [-1, +10] surrounding the announcement date together with mean (median) differences in abnormal returns. Overall, both U.S. and U.K. GCM firms experience significant negative abnormal returns on the days leading up to the announcement day. Over

## TABLE 8.3

## Daily Abnormal Returns Surrounding the GCM Announcement

This table presents mean (median) daily abnormal returns for the 21 trading day period surrounding the GCM announcement date (t=0) relating to my population of 823 non-finance, non-utility, industry firms traded on the NYSE, AMEX or NASDAQ receiving first-time going-concern modified audit reports between 01.01.1995 and 31.12.2002 in the U.S., and 127 non-finance industry firms traded on the London Stock Exchange or the Unlisted Securities Market receiving first-time going-concern modified audit reports between 01.01.1995 and 31.12.2002 in the U.K.. Abnormal returns are market-adjusted returns. The S&P 600 Small Cap. Index and FTSE Small Cap. Index are used as benchmark indices for U.S. and U.K. GCM firms respectively. Panel A reports mean (median) differences in daily abnormal returns between the two institutional environments, along with their significance levels, and Panel B reports similar statistics for [-10, -2], [-1,0], [-1,+1], and [-1,+10] cumulative abnormal returns (CAR) windows.

Panel A: Daily Returns (AARi)

| | United States (n=823) | | | | | United Kingdom (n=127) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Trading days | Mean | p-value | Median | p-value | %<0 | Mean | p-value | Median | p-value | %<0 | Mean difference | p-value | Median difference | p-value | Difference in proportions |
| -10 | -0.006 | 0.118 | -0.003 | 0.007 | 54.31 | 0.000 | 0.984 | -0.002 | 0.000 | 67.72 | -0.006 | 0.293 | -0.002 | 0.452 | 0.005 |
| -9 | -0.004 | 0.278 | -0.002 | 0.622 | 50.55 | 0.001 | 0.893 | -0.001 | 0.007 | 62.20 | -0.004 | 0.447 | 0.000 | 0.946 | 0.014 |
| -8 | -0.002 | 0.618 | -0.005 | 0.005 | 54.56 | 0.002 | 0.520 | -0.001 | 0.146 | 55.12 | -0.004 | 0.441 | -0.004 | 0.114 | 0.905 |
| -7 | -0.003 | 0.436 | -0.003 | 0.130 | 52.25 | -0.004 | 0.077 | -0.001 | 0.029 | 58.27 | 0.002 | 0.655 | -0.002 | 0.687 | 0.206 |
| -6 | -0.005 | 0.142 | -0.006 | 0.001 | 55.53 | -0.005 | 0.048 | -0.001 | 0.000 | 67.72 | 0.001 | 0.898 | -0.004 | 0.406 | 0.010 |
| -5 | 0.000 | 0.891 | -0.003 | 0.027 | 53.58 | -0.003 | 0.392 | -0.001 | 0.001 | 62.99 | 0.003 | 0.496 | -0.002 | 0.679 | 0.047 |
| -4 | 0.001 | 0.748 | -0.003 | 0.014 | 53.95 | 0.006 | 0.103 | -0.001 | 0.011 | 59.84 | -0.005 | 0.304 | -0.002 | 0.104 | 0.214 |
| -3 | -0.008 | 0.017 | -0.005 | 0.000 | 55.65 | -0.003 | 0.302 | -0.001 | 0.000 | 65.35 | -0.005 | 0.282 | -0.004 | 0.207 | 0.040 |
| -2 | -0.005 | 0.148 | -0.003 | 0.067 | 52.86 | -0.002 | 0.343 | -0.001 | 0.000 | 66.93 | -0.002 | 0.546 | -0.002 | 0.566 | 0.003 |
| -1 | -0.002 | 0.516 | -0.004 | 0.000 | 55.65 | -0.009 | 0.013 | -0.002 | 0.002 | 62.99 | 0.007 | 0.144 | -0.003 | 0.787 | 0.120 |
| 0 | -0.011 | 0.004 | -0.005 | 0.000 | 54.43 | -0.039 | 0.000 | -0.003 | 0.000 | 72.44 | 0.029 | 0.006 | -0.003 | 0.202 | 0.000 |
| 1 | -0.030 | 0.000 | -0.019 | 0.000 | 63.06 | -0.015 | 0.001 | -0.002 | 0.000 | 70.08 | -0.016 | 0.013 | -0.017 | 0.013 | 0.125 |
| 2 | -0.018 | 0.000 | -0.009 | 0.000 | 57.84 | -0.004 | 0.409 | -0.001 | 0.003 | 61.42 | -0.013 | 0.039 | -0.007 | 0.053 | 0.446 |
| 3 | 0.008 | 0.050 | 0.000 | 0.972 | 49.33 | 0.006 | 0.365 | -0.001 | 0.002 | 62.99 | 0.002 | 0.788 | 0.001 | 0.915 | 0.004 |
| 4 | 0.004 | 0.288 | 0.000 | 0.888 | 49.09 | 0.000 | 0.925 | -0.001 | 0.017 | 58.27 | 0.004 | 0.357 | 0.001 | 0.734 | 0.054 |
| 5 | 0.003 | 0.374 | -0.003 | 0.053 | 53.10 | -0.008 | 0.093 | -0.001 | 0.007 | 61.42 | 0.011 | 0.060 | -0.002 | 0.741 | 0.080 |
| 6 | 0.006 | 0.100 | -0.003 | 0.007 | 54.43 | 0.002 | 0.496 | -0.001 | 0.124 | 55.91 | 0.004 | 0.448 | -0.002 | 0.129 | 0.757 |
| 7 | -0.004 | 0.274 | -0.005 | 0.000 | 56.14 | -0.003 | 0.376 | -0.001 | 0.005 | 60.63 | -0.001 | 0.783 | -0.004 | 0.124 | 0.341 |
| 8 | 0.002 | 0.494 | -0.004 | 0.001 | 55.16 | 0.002 | 0.402 | -0.001 | 0.011 | 59.84 | 0.000 | 0.907 | -0.004 | 0.108 | 0.323 |
| 9 | 0.004 | 0.282 | -0.003 | 0.024 | 53.10 | 0.003 | 0.261 | -0.001 | 0.001 | 63.78 | 0.001 | 0.881 | -0.001 | 0.299 | 0.025 |
| 10 | -0.005 | 0.137 | -0.007 | 0.000 | 56.74 | -0.005 | 0.138 | -0.001 | 0.000 | 66.14 | 0.000 | 0.984 | -0.006 | 0.143 | 0.046 |

## TABLE – 8.3 Continued

Panel B: Event Windows (CARs)

| CAR window | United States (n=823) Mean | p-value | Median | p-value | %<0 | United Kingdom (n=127) Mean | p-value | Median | p-value | %<0 | Mean difference | p-value | Median difference | p-value | Difference in proportions |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [-10,-2] | -0.020 | 0.012 | -0.030 | 0.001 | 56.62 | -0.007 | 0.518 | -0.013 | 0.012 | 59.84 | -0.013 | 0.331 | -0.018 | 0.279 | 0.495 |
| [-1,0] | -0.013 | 0.005 | -0.011 | 0.002 | 54.68 | -0.050 | 0.000 | -0.007 | 0.000 | 73.22 | 0.038 | 0.002 | -0.004 | 0.048 | 0.000 |
| [-1,+1] | -0.041 | 0.000 | -0.026 | 0.000 | 59.42 | -0.065 | 0.000 | -0.011 | 0.000 | 74.80 | 0.023 | 0.087 | -0.015 | 0.344 | 0.001 |
| [-1,+10] | -0.026 | 0.012 | -0.037 | 0.001 | 56.50 | -0.064 | 0.000 | -0.029 | 0.000 | 70.71 | 0.038 | 0.064 | -0.008 | 0.344 | 0.002 |

the window [-10, -2], U.S. and U.K. GCM firms experience mean (median) CARs of -2.0% (-3.0%) and -0.7% (-1.3%), respectively. However, these mean and median differences between the U.S. and U.K. firms are not significant (p=0.331 and p=0.279, respectively). In the days immediately surrounding the announcement day, U.K. firms experience mean (median) abnormal returns of –0.9% (-0.2%), -3.9% (-0.3%) and -1.5% (-0.2%) on days -1, 0 and +1, respectively. Similarly, U.S. firms experience -0.2% (-0.4%), -0.11% (-0.5%) and -3.0% (-1.9%), respectively. These results are more or less significant at the 1% level. Based on these results, I reject null hypothesis H14 of no abnormal returns.

I note that the average CARs over the windows [-1, 0], [-1, +1] and [-1, +10] are significantly more negative for U.K. firms compared to U.S. firms (p=0.002, p=0.087 and p=0.064, respectively). However, the median CARs over the same windows are more significantly negative for U.S. firms compared to U.K. firms. Given what appears to be opposite findings for the mean and median CARs over the days immediately surrounding the GCM announcement, I speculate that, since I do not control for systematic differences between U.S. and U.K. firms, these particular findings may be driven by these differences.

In my discussion of Table 8.2 Panel A, I noted previously that U.K. and U.S. firms differed significantly mainly in terms of the decline in earnings and the level of financial distress. I now control for these two factors and compare the CARs over the various event windows. Table 8.4 presents the univariate results for sub-samples of U.S. and U.K. firms matched on the population-relative financial distress and change in earnings measures to further examine null hypothesis H15. After controlling for

financial distress, U.K. firms experience more negative average CARs than U.S. firms over the windows [-1, 0] and [-1, +10].

**TABLE 8.4**
**Cumulative Abnormal Returns Surrounding the GCM Announcement**

This table presents mean (median) differences for [-10, -2], [-1,0], [-1,+1], and [-1,+10] cumulative abnormal returns (CARs) windows surrounding the GCM announcement date (t=0) relating to my population of 823 non-finance, non-utility, industry firms traded on the NYSE, AMEX or NASDAQ receiving first-time going-concern modified audit reports between 01.01.1995 and 31.12.2002 in the U.S., and 127 non-finance industry firms traded on the London Stock Exchange or Unlisted Securities Market receiving first-time going-concern modified audit reports between 01.01.1995 and 31.12.2002 in the U.K.. Cumulative abnormal returns for each firm ($CAR_i$) are calculated by summing the daily abnormal returns ($AR_{i,t}$) over the two-day event window [-1, 0] where day 0 is the relevant GCM disclosure event date. Abnormal returns are market-adjusted returns. The S&P 600 Small Cap. Index and FTSE Small Cap. Index are used as benchmark indices for the U.S. and the U.K. GCM firms respectively. Panel A report results matched on population relative z-score (PRZ) and Panel B report similar results matched on population relative change in earnings (PRCHEAR). In both the panels each U.K. GCM firm is matched with two U.S. GCM firms.

| CAR window | Mean difference (US-UK) | p-value | Median difference (US-UK) | p-value | %<0 |
|---|---|---|---|---|---|
| **Panel A: Matched on PRZ** | | | | | |
| [-10,-2] | 0.000 | 0.988 | -0.009 | 0.621 | 52.80 |
| [-1,0] | 0.031 | 0.040 | 0.008 | 0.102 | 43.20 |
| [-1,+1] | 0.015 | 0.406 | -0.004 | 0.907 | 51.20 |
| [-1,+10] | 0.049 | 0.072 | 0.033 | 0.213 | 44.72 |
| **Panel B: Matched on PRCHEAR** | | | | | |
| [-10,-2] | 0.005 | 0.816 | -0.009 | 0.922 | 52.00 |
| [-1,0] | 0.037 | 0.014 | 0.012 | 0.074 | 43.20 |
| [-1,+1] | 0.022 | 0.162 | 0.000 | 0.614 | 49.60 |
| [-1,+10] | 0.043 | 0.101 | 0.028 | 0.271 | 46.60 |

However, the median CARs over the various windows do not differ significantly between the U.S. and U.K. Controlling for the change in earnings, I observe that U.K. firms experience more negative CARs than U.S. firms over the window [-1,0]. Again, there are no significant differences in median CARs between the U.S. and U.K. firms over the various event windows. Taken together, the overall results presented in Tables 8.3 and 8.4 only provide tenuous evidence that is consistent with the

expectation that the market reaction to the GCM is more negative for U.K. firms than for U.S. firms, making it difficult for me to strongly reject null hypothesis H15.

### *8.3.2. Multivariate Results – Short window*

Because of the inconclusive results of my short-term univariate analysis in testing H15, in this section, I run the multivariate regression model of equation (6) to examine whether the CARs associated with the GCM announcement differ significantly between the U.S. and U.K. GCM firms, controlling for other factors that may explain the market reaction to the GCM event. I focus primarily on the CARs in the window [-1,0], [-1, +1] and [-1, +10] to examine whether there is an immediate differential market response in the U.K. versus the U.S. to the announcement of the GCM. In further analyses in section 8.4 below, I explore a longer time-horizon. The multivariate results for all three regressions are presented in Table 8.5.

After controlling for other factors that might be correlated with the market's immediate reaction to the GCM announcement, I find that firms in the U.K. experience more significant negative CARs over the three event windows. Table 8.5 shows the coefficients on the binary bankruptcy regime variable (REGIME) to be -0.049, -0.041 and -0.060 over the windows [-1, 0], [-1, +1] and [-1, +10], respectively, all significant at better than the 5% level. This indicates that the CARs of U.K. firms are 4.9%, 4.1% and 6.0% more negative than U.S. firm CARs after controlling for other factors. As expected, firm size is negatively associated with the CARs (over [-1, +1]). In general, the coefficients on DELIST and BKT are significantly negative, suggesting that the market reacts more negatively to the GCM firms that are associated with higher bankruptcy risk at the time of the announcement.

## TABLE 8.5
## Short-term Window Regression Results

This table presents the results of a multivariate analysis examining differences in two-day, three-day and twelve-days cumulative abnormal returns (CARs) centred on the GCM announcement day between my population of 823 non-finance, non-utility, industry firms traded on the NYSE, AMEX or NASDAQ receiving first-time going-concern modified audit reports between 01.01.1995 and 31.12.2002 in the U.S., and 127 non-finance industry firms trading on the London Stock Exchange or Unlisted Securities Market receiving first-time going-concern modified audit reports between 01.01.1995 and 31.12.2002 in the U.K. The dependent variables are two-day CAR[-1,0], three-day CAR[-1,+1], and twelve-day CAR[-1,+10] where day 0 is the relevant GCM disclosure event date. The table provides coefficient estimates along with their significance levels for the following regression model:

$$CAR_i = \lambda_0 + \lambda_1 REGIME_i + \lambda_2 (PRTA)_i + \lambda_3 BM_i + \lambda_4 MOM_i + \lambda_5 PRCHEAR_i + \lambda_6 PREDGC_i + \lambda_7 DIVID_i + \lambda_8 PRZ_i + \lambda_9 LNCHPRZ_i + \lambda_{10} LNCHPRLEV_i + \lambda_{11} DELIST_i + \lambda_{12} BKT_i + \lambda_{13} AUD_i + u_i$$

with the variable definitions given below the table.

| Dependent variable | CAR(-1,0) | | CAR(-1,1) | | CAR(-1,10) | |
|---|---|---|---|---|---|---|
| Independent variables | Coefficients | Sig.(p-value) | Coefficients | Sig.(p-value) | Coefficients | Sig.(p-value) |
| REGIME | -0.049 | 0.000 | -0.041 | 0.020 | -0.060 | 0.028 |
| PRTA | 0.000 | 0.362 | -0.001 | 0.029 | -0.001 | 0.224 |
| BM | -0.002 | 0.330 | -0.001 | 0.621 | 0.005 | 0.163 |
| MOM | -0.062 | 0.243 | 0.011 | 0.870 | -0.132 | 0.222 |
| PRCHEAR | 0.000 | 0.470 | 0.000 | 0.598 | 0.000 | 0.774 |
| PREDGC | -0.006 | 0.491 | -0.018 | 0.137 | -0.002 | 0.905 |
| DIVID | -0.009 | 0.402 | -0.016 | 0.228 | -0.005 | 0.797 |
| PRZ | -0.005 | 0.816 | -0.006 | 0.838 | -0.012 | 0.789 |
| LNCHPRZ | -0.006 | 0.127 | -0.002 | 0.651 | -0.007 | 0.397 |
| LNCHPRLEV | 0.001 | 0.740 | -0.004 | 0.512 | -0.009 | 0.309 |
| DELIST | -0.019 | 0.071 | -0.032 | 0.019 | -0.055 | 0.010 |
| BKT | -0.010 | 0.441 | -0.031 | 0.060 | -0.093 | 0.000 |
| AUD | -0.014 | 0.172 | -0.036 | 0.009 | -0.042 | 0.053 |
| Intercept | 0.027 | 0.167 | 0.040 | 0.117 | 0.051 | 0.207 |
| No. of cases | | 938 | | 938 | | 942 |
| Model F-value (d.f=13) | | 1.63 | | 3.02 | | 2.44 |
| F significance (p-value) | | 0.07 | | 0.00 | | 0.00 |
| Adjusted R-squared | | 0.01 | | 0.03 | | 0.02 |

**TABLE 8.5 - Continued**

REGIME = bankruptcy regime proxy (1 if GCM firm is a U.K. firm and 0 if it is U.S.), PRTA = percentile based population relative total assets, BM = book value of assets divided by market capitalisation at the end of the calendar month of audit report publication date, MOM = monthly average of prior 11-months (t-12 to t-2) raw returns, PRCHEAR = percentile based population relative annual change in earnings, PREDGC = GCM expectations dummy calculated using Mutchler (1983) for U.S. and Citron and Taffler (2001) for U.K. (1 if GCM expected, 0 otherwise), DIVID = dividend paid dummy (1 if dividend paid, 0 if nominal or omission), PRZ = population relative financial distress measure computed using Altman (1968) for U.S. firms and Taffler (1984) for U.K. firms, LNCHPRZ = natural log of change in population relative z-score, LNPRLEV = natural log of change in population relative leverage, DELIST = delisting dummy (1 if the firm is delisted for performance reasons within one year of the audit report date, 0 otherwise), BKT = bankruptcy dummy (1 if the firm goes into bankruptcy within one year of the audit report date, 0 otherwise), AUDITOR = audit quality proxy dummy (1 if Big5/Big6, 0 otherwise), and $\lambda 0 \ldots . \lambda 14$ are the regression parameter estimates and $u_i$ is a mean zero stochastic error term.

Consistent with expectations, there is also some evidence of incremental information content of audit reports issued by BIG5/BIG6 indicating, to some degree, higher quality, and credibility of their audits as compared to non-BIG5/BIG6 auditors. The remaining control variables are generally not significant. The overall adj.-$R^2$s range between 1.0-3.0% and the models have significant explanatory power albeit not of high economic magnitude.[58]

Overall, my results consistently show that U.K. firms experience more negative abnormal returns compared to U.S. firms in the days around the GCM announcement. These findings allow me to reject null hypothesis H15 in the short-run and are consistent with expectations that equity market participants react more adversely to the GCM announcement in a creditor-friendly bankruptcy regime than in a debtor-friendly bankruptcy regime. Studies examining the information content of the auditor's going-concern opinion have not previously documented this finding.

### *8.3.3. Univariate results – Long window*

Potential limitations exist to confining the event window to the days immediately surrounding the GCM announcement. These issues are common to most event studies examining market reaction in the short-run. Important to note is the issue of confounding contemporaneous news releases (Bailey, 1982). Difficulties also arise in identifying the exact announcement date of the event and the results may vary depending on the length of the event window (Dodd, Dopuch, Holthausen, and Leftwich, 1984). Hence, these measurement errors may contaminate the short-run analyses. To increase the power of my tests, I examine the comparative longer-term

[58] Results are also very similar when I run my short-term regressions matched on PRZ or PRCHEAR and interestingly the explanatory power (adjusted R-squared) of some models increases to around 10%.

market reaction to the GCM announcement in the U.S. and in the U.K. By observing post-GCM announcement returns commencing from the start of the next calendar month from the GCM announcement event, for a period up to twelve months beyond the announcement, I am biased against finding any systematic difference in subsequent returns. This is because any temporary, spurious differences in market reactions to the GCM in the U.K. and U.S. should be eliminated in the long-run. That is, I would not expect a significant difference in the pattern of post-GCM abnormal returns between the two institutional environments. However, if differences in the allocation of decision control rights between creditors and debtors embedded in the U.S. and U.K. bankruptcy regimes have an impact on the information content of the GCM announcement, then I would expect a systematic difference in the post-GCM returns of U.K. and U.S. firms. Consistent with expectations, if the GCM announcement has more negative implications in the creditor-biased U.K. bankruptcy regime compared to the debtor-biased regime in the U.S., then I would expect the long-term returns to be more negative for U.K. firms compared to U.S. firms.

Chapter 5 of my thesis shows that firms receiving GCMs in the U.S. for the first-time continue to experience significant negative abnormal returns for up to 12 months subsequent to the GCM announcement. Taffler, Lu, and Kausar (2004) report similar results for the U.K. After controlling for competing explanations for the systematic downward drift in abnormal returns over the one-year period, these studies conclude that both markets underreact to the negative implications contained in the GCM opinion issued by auditors. I build on these studies by directly comparing the post-GCM abnormal return drift of U.S. firms to that of U.K. firms. I expect that in a debtor-friendly regime (like Chapter 11), an unfavourable public signal such as the

issuance of a GCM, which highlights a significantly increased probability of default, will have a less negative impact on the stock price because of the less adverse consequences arising under the bankruptcy code of this regime if the firm fails, compared to a creditor-friendly regime (as in the U.K.). Based on this, I predict that the subsequent underperformance of firms with first-time GCM audit opinion under the debtor-friendly U.S. regime will be of a lower magnitude (less negative) than under the creditor-friendly U.K. regime.

Table 8.6 presents the post-GCM buy-and-hold returns (BHARs) for the full sample of U.K. and U.S. GCM firms for up to 12 months after the announcement month.[59] The average 12-month BHAR for U.K. firms is -31.3% compared to -18.1% for U.S. firms. This difference is significant (p=0.084). The median 12-month BHAR for U.K. firms is significantly more negative than the median 12-month BHAR for U.S. firms (-43% v -17.8%) (p=0.007). Figure 8.1 graphs the mean buy-and-hold returns over the 12 months post-GCM announcement event for my U.S. and U.K. GCM firms. Overall, my univariate results are consistent with my expectations that the post-GCM drift for U.K. firms is more negative than the post-GCM drift for U.S. firms.[60]

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[59] Extreme outliers are truncated at the 1st and 99th percentiles; however, results are qualitatively similar even if I employ my unadjusted GCM sample.

[60] Qualitatively similar results are obtained when U.S. GCM firms are matched to U.K. GCM firms on the level of financial distress and changes in earnings.

## TABLE 8.6

### First-time Going-concern Modified Audit Report Post-announcement Buy-and-hold Returns

This table presents buy-and-hold abnormal returns (BHARs) for my population of 823 non-finance, non-utility, industry firms traded on the NYSE, AMEX or NASDAQ receiving first-time going-concern modified audit reports between 01.01.1995 and 31.12.2002 in the U.S., and 127 non-finance industry firms traded on the London Stock Exchange or Unlisted Securities Market receiving first-time going-concern modified audit reports between 01.01.1995 and 31.12.2002 in the U.K.. The 12-month period reported commences on the first day of the month immediately following the going-concern opinion audit report release month. Returns earned by delisted firms are represented by the equivalent monthly return on the S&P 600 Small Cap. Index for U.S. GCM firms and FTSE Small Cap. Index for U.K. GCM firms. BHARs results are derived using a control firm benchmark. Mean (median) monthly differences in BHARs between the two institutional environments along with their significance levels are also reported.

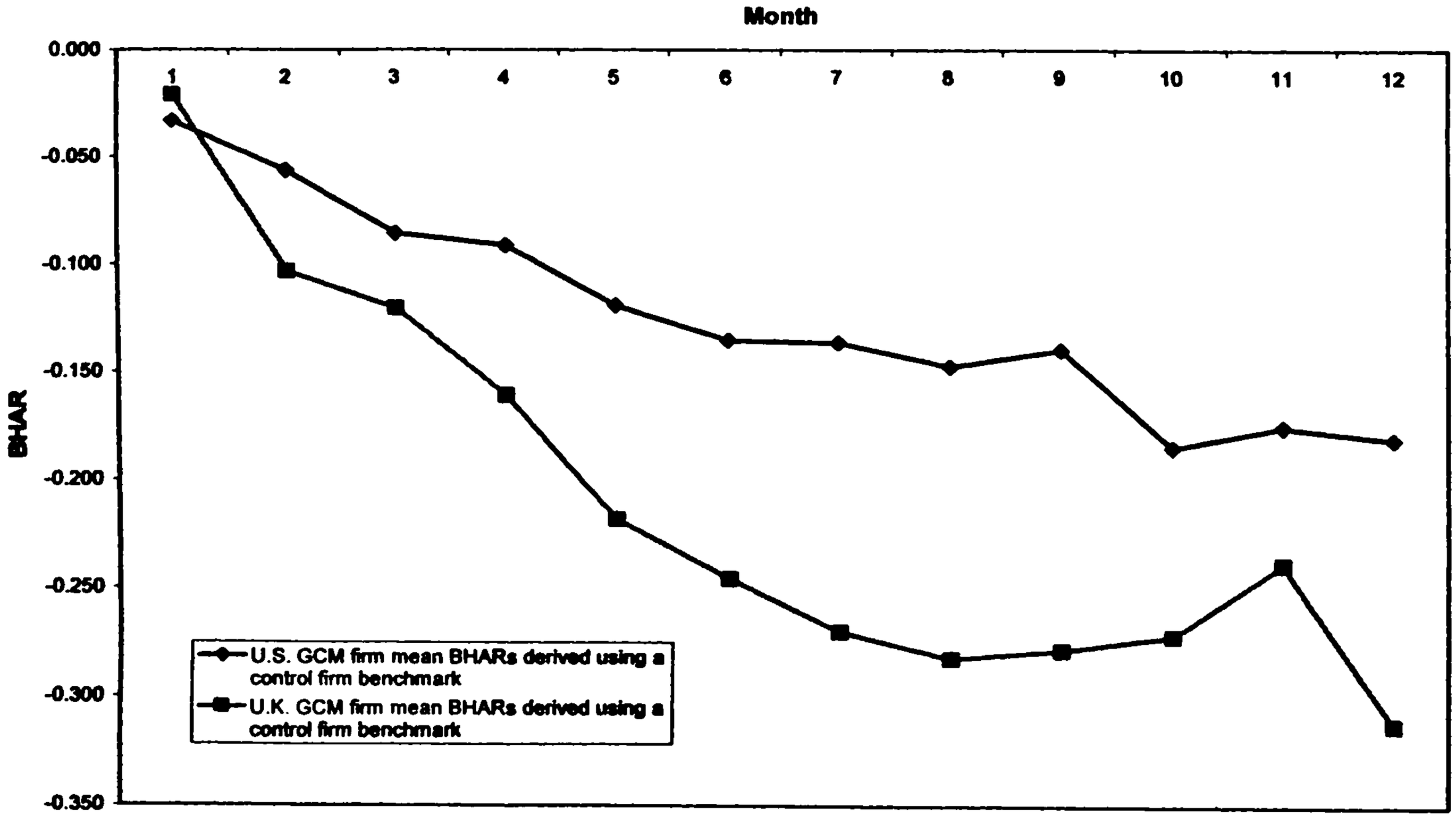
Each U.S. GCM firm in my population is matched with that non-finance, non-utility industry, non-GCM firm with most similar size and book-to-market ratio. Specifically, in the U.S. all non-financial, non-utility firms without GCM audit reports traded on the NYSE, AMEX or NASDAQ are first identified with a market value of equity between 70% and 130% of that of the sample firm. The control firm is then selected as that firm with book-to-market ratio closest to that of the sample firm. A similar procedure is followed to identify control firms for my U.K. GCM firms. In particular, control firms are selected from all non-financial firms without a GCM audit report traded on the London Stock Exchange or Unlisted Securities Market (USM).

| | United States (n=823) | | | United Kingdom (n=127) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Months | Mean | Median | %<0 | Mean | Median | %<0 | Mean difference | p-value | Median difference | p-value | Difference in proportions |
| 1 | -0.033 | -0.050 | 0.579 | -0.021 | 0.000 | 0.496 | -0.012 | 0.667 | -0.050 | 0.371 | 0.084 |
| 2 | -0.057 | -0.057 | 0.571 | -0.103 | -0.050 | 0.569 | 0.047 | 0.187 | -0.007 | 0.588 | 0.961 |
| 3 | -0.086 | -0.103 | 0.575 | -0.120 | -0.072 | 0.593 | 0.034 | 0.375 | -0.032 | 0.864 | 0.701 |
| 4 | -0.091 | -0.129 | 0.589 | -0.161 | -0.133 | 0.642 | 0.070 | 0.129 | 0.004 | 0.541 | 0.261 |
| 5 | -0.119 | -0.135 | 0.583 | -0.219 | -0.186 | 0.642 | 0.100 | 0.058 | 0.051 | 0.122 | 0.210 |
| 6 | -0.135 | -0.166 | 0.605 | -0.246 | -0.255 | 0.699 | 0.110 | 0.067 | 0.089 | 0.093 | 0.045 |
| 7 | -0.137 | -0.169 | 0.602 | -0.270 | -0.231 | 0.715 | 0.133 | 0.045 | 0.062 | 0.046 | 0.016 |
| 8 | -0.148 | -0.185 | 0.604 | -0.282 | -0.335 | 0.675 | 0.134 | 0.062 | 0.150 | 0.042 | 0.132 |
| 9 | -0.140 | -0.160 | 0.601 | -0.278 | -0.312 | 0.642 | 0.138 | 0.079 | 0.152 | 0.067 | 0.386 |
| 10 | -0.185 | -0.163 | 0.576 | -0.272 | -0.327 | 0.642 | 0.087 | 0.318 | 0.164 | 0.077 | 0.167 |
| 11 | -0.176 | -0.156 | 0.581 | -0.239 | -0.327 | 0.650 | 0.064 | 0.498 | 0.171 | 0.102 | 0.147 |
| 12 | -0.181 | -0.178 | 0.582 | -0.313 | -0.430 | 0.699 | 0.132 | 0.084 | 0.252 | 0.007 | 0.001 |

**FIGURE 8.1**

**Twelve Month Post-Going-Concern Modified Audit Report Announcement Mean Buy-And-Hold Abnormal Returns**

This figure graphs the mean buy-and-hold abnormal returns (BHARs) for 12 months after the publication of a first-time going-concern modified audit report for my population of 823 non-finance, non-utility, industry firms traded on the NYSE, AMEX or NASDAQ receiving first-time going-concern modified audit reports between 01.01.1995 and 31.12.2002 in the U.S., and 127 non-finance industry firms traded on the London Stock Exchange or Unlisted Securities Market receiving first-time going-concern modified audit reports between 01.01.1995 and 31.12.2002 in the U.K.



### *8.3.4. Multivariate results – Long window*

My longer-term univariate results presented in the previous section provide evidence that U.K. first-time GCM firms experience more negative longer-term BHARs than U.S. first-time GCM firms. I argue that this is mainly due to divergent bankruptcy codes of the two institutional environments. Although, by examining longer-term abnormal returns on a univariate basis I overcome the limitations of analysing short-term returns (see previous section) but such an analysis does not control for other explanations for this difference in BHARs across the U.K. and the U.S. Exploring this further in a multivariate context, I examine whether this post-GCM drift is significantly different for U.K. and U.S. GCM firms after controlling for other factors that may explain the difference in this drift. I run the regression model of equation (6) for the full sample of U.S. and U.K. GCM firms.[61] The key variable of interest is the independent variable (REGIME) which indicates the bankruptcy regime associated with my GCM firms (i.e., REGIME = 1 if the GCM firm is operating the U.K. and = 0 if it is in the U.S.). The results are presented in Panel A of Table 8.7.

For the full sample, Panel A of table 8.7 for BHAR12 (BHAR6) shows the bankruptcy regime dummy variable has a coefficient of -0.348 (p=0.001) (-0.311 (p=0.000)) suggesting that U.K. firm BHARs are 34.8% (31.1%) more negative compared to U.S. firms in the one-year (6-month) period after the GCM announcement, controlling for other factors. Both DELIST and BKT are significantly

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[61] Due to compounding of monthly returns, extreme observations cause serious problems in longer-term BHAR results. To obtain meaningful results for my OLS regressions, I use Cook's-D influence statistic to truncate outliers in the 6-month and 12-month BHARs. For robustness purposes, I also employ robust regression procedures, namely the M-estimation approach, which gives less weight to extreme observations but does not discard them as opposed to the least-squares method where the influence of a datum on the estimate increases linearly with the size of its error, confirming the non-robusteness of the least-squares estimate. M-estimation is implemented using iteratively reweighted least-squares. For details see Huber (1973, 1981). My robust regression results are qualitatively similar to those reported in the paper. Results are also not very different even if I run OLS regressions using my full GCM sample.

negative (-0.40 and -0.45), suggesting that firms that delist or enter bankruptcy experience more negative BHARs, clearly highlighting a significantly negative relation between stock returns, distress risk, and bankruptcy. The adj.-$R^2$s for my models are around 7% and their explanatory powers are highly significant. Overall, my longer-term univariate and multivariate results together provide support for my expectation that firms in a creditor-friendly bankruptcy regime like the U.K. will experience more negative post-GCM drift in abnormal returns than firms in a debtor-friendly bankruptcy regime like the U.S. These findings are consistent with my expectations, leading to the rejection of null hypothesis H15 at conventional levels. One possible explanation for these results is that the negative information implied by the GCM has more severe economic consequences for stockholders in a creditor-friendly regime than in a debtor-friendly regime. This result has not been previously documented.

## TABLE 8.7
## Medium-Term Buy-And-Hold Abnormal Returns Regression Results

This table presents the results of a multivariate analysis examining differences in 6-month and 12-month buy-and-hold abnormal returns (BHARs) subsequent to the GCM announcement month between my population of 823 non-finance, non-utility, industry firms traded on the NYSE, AMEX or NASDAQ receiving first-time going-concern modified audit reports between 01.01.1995 and 31.12.2002 in the U.S., and 127 non-finance industry firms traded on the London Stock Exchange or Unlisted Securities Market receiving first-time going-concern modified audit reports between 01.01.1995 and 31.12.2002 in the U.K. The dependent variable are 6-month and 12-month BHAR. The table provides coefficient estimates along with their significance levels for the following regression model:

$$BHAR_i = \lambda_0 + \lambda_1 REGIME_i + \lambda_2 (PRTA)_i + \lambda_3 BM_i + \lambda_4 MOM_i + \lambda_5 PRCHEAR_i + \lambda_6 PREDGC_i + \lambda_7 DIVID_i + \lambda_8 PRZ_i + \lambda_9 LNCHPRZ_i + \lambda_{10} LNCHPRLEV_i + \lambda_{11} DELIST_i + \lambda_{12} BKT_i + \lambda_{13} AUD_i + u_i$$

with the variable definitions given below the table. Panel A reports the results for my full GCM samples in the U.S. and the U.K. Panel B reports similar results matched on population relative z-score (PRZ) and Panel C matched on population relative change in earnings (PRCHEAR). Each U.K. GCM firm is matched with two U.S. GCM firms in Panel B and Panel C. Panel D reports similar results excluding bankrupt firms (BKT).

**Panel A: OLS regression model analysis - full sample**

| Dependent variable | BHAR6 | | BHAR12 | |
|---|---|---|---|---|
| Independent variables | Coefficients | Sig.(p-value) | Coefficients | Sig.(p-value) |
| REGIME | -0.261 | 0.000 | -0.352 | 0.001 |
| PRTA | -0.001 | 0.440 | 0.000 | 0.865 |
| BM | 0.005 | 0.586 | 0.010 | 0.513 |
| MOM | -0.255 | 0.353 | -0.753 | 0.074 |
| PRCHEAR | 0.000 | 0.904 | 0.001 | 0.372 |
| PREDGC | 0.044 | 0.373 | 0.080 | 0.292 |
| DIVID | 0.010 | 0.858 | 0.086 | 0.299 |
| PRZ | 0.238 | 0.035 | 0.136 | 0.436 |
| LNCHPRZ | -0.030 | 0.132 | -0.059 | 0.056 |
| LNCHPRLEV | -0.034 | 0.151 | -0.010 | 0.795 |
| DELIST | -0.218 | 0.000 | -0.378 | 0.000 |
| BKT | -0.488 | 0.000 | -0.761 | 0.000 |
| AUD | 0.025 | 0.647 | 0.115 | 0.173 |
| Intercept | -0.163 | 0.110 | -0.206 | 0.196 |
| No. of cases | | 900 | | 906 |
| Model F-value (d.f=13) | | 5.702 | | 5.930 |
| F significance (p-value) | | 0.000 | | 0.000 |
| Adjusted R-squared | | 0.065 | | 0.067 |

## TABLE 8.7 – Continued

| **Panel B: OLS regression model analysis - matched on PRZ** | | | | |
|---|---|---|---|---|
| Dependent variable | **BHAR6** | | **BHAR12** | |
| Independent variables | Coefficients | Sig.(p-value) | Coefficients | Sig.(p-value) |
| REGIME | -0.182 | 0.041 | -0.389 | 0.004 |
| PRTA | 0.001 | 0.772 | 0.001 | 0.662 |
| BM | 0.004 | 0.792 | 0.006 | 0.797 |
| MOM | -0.402 | 0.340 | -1.384 | 0.030 |
| PRCHEAR | -0.001 | 0.428 | -0.001 | 0.683 |
| PREDGC | 0.008 | 0.919 | 0.027 | 0.818 |
| DIVID | -0.015 | 0.870 | 0.129 | 0.356 |
| PRZ | 0.255 | 0.197 | 0.437 | 0.147 |
| LNCHPRZ | -0.023 | 0.457 | -0.054 | 0.243 |
| LNCHPRLEV | -0.040 | 0.272 | -0.023 | 0.680 |
| DELIST | -0.083 | 0.362 | -0.287 | 0.034 |
| BKT | -0.514 | 0.000 | -0.737 | 0.000 |
| AUD | 0.170 | 0.049 | 0.232 | 0.075 |
| Intercept | -0.325 | 0.093 | -0.459 | 0.119 |
| No. of cases | | 361 | | 362 |
| Model F-value (d.f =13) | | 2.689 | | 3.516 |
| F significance (p-value) | | 0.001 | | 0.000 |
| Adjusted R-squared | | 0.057 | | 0.083 |

| **Panel C: OLS regression model analysis - matched on PRCHEAR** | | | | |
|---|---|---|---|---|
| Dependent variable | **BHAR6** | | **BHAR12** | |
| Independent variables | Coefficients | Sig.(p-value) | Coefficients | Sig.(p-value) |
| REGIME | -0.333 | 0.000 | -0.397 | 0.001 |
| PRTA | -0.002 | 0.249 | 0.003 | 0.273 |
| BM | 0.009 | 0.543 | 0.014 | 0.510 |
| MOM | -0.711 | 0.121 | -1.317 | 0.048 |
| PRCHEAR | 0.000 | 0.803 | 0.001 | 0.663 |
| PREDGC | 0.003 | 0.966 | 0.100 | 0.362 |
| DIVID | -0.080 | 0.390 | -0.047 | 0.727 |
| PRZ | 0.544 | 0.016 | 0.352 | 0.269 |
| LNCHPRZ | -0.081 | 0.074 | -0.148 | 0.019 |
| LNCHPRLEV | 0.025 | 0.563 | 0.050 | 0.433 |
| DELIST | -0.150 | 0.100 | -0.368 | 0.007 |
| BKT | -0.411 | 0.000 | -0.689 | 0.000 |
| AUD | 0.135 | 0.109 | 0.164 | 0.189 |
| Intercept | -0.385 | 0.047 | -0.394 | 0.151 |
| No. of cases | 360 | | 361 | |
| Model F-value (d.f =13) | 3.232 | | 3.781 | |
| F significance (p-value) | 0.000 | | 0.000 | |
| Adjusted R-squared | 0.075 | | 0.091 | |

## TABLE 8.7 - Continued

| **Panel D: OLS regression model analysis - excluding subsequent bankrupt GCM firms** | | | | |
|---|---|---|---|---|
| Dependent variable | **BHAR6** | | **BHAR12** | |
| Independent variables | Coefficients | Sig.(p-value) | Coefficients | Sig.(p-value) |
| REGIME | -0.256 | 0.001 | -0.392 | 0.001 |
| PRTA | 0.000 | 0.930 | 0.002 | 0.444 |
| BM | 0.005 | 0.686 | -0.004 | 0.838 |
| MOM | -0.265 | 0.390 | -0.666 | 0.168 |
| PRCHEAR | 0.000 | 0.821 | 0.001 | 0.429 |
| PREDGC | 0.055 | 0.313 | 0.051 | 0.547 |
| DIVID | 0.063 | 0.296 | 0.138 | 0.140 |
| PRZ | 0.199 | 0.100 | 0.189 | 0.321 |
| LNCHPRZ | -0.028 | 0.193 | -0.073 | 0.031 |
| LNCHPRLEV | -0.021 | 0.399 | 0.002 | 0.964 |
| DELIST | -0.221 | 0.000 | -0.385 | 0.000 |
| AUD | 0.044 | 0.457 | 0.127 | 0.171 |
| Intercept | -0.182 | 0.094 | -0.260 | 0.131 |
| | | | | |
| No. of cases | | 768 | | 773 |
| Model F-value (d.f =12) | | 2.478 | | 3.529 |
| F significance (p-value) | | 0.003 | | 0.000 |
| Adjusted R-squared | | 0.023 | | 0.038 |

REGIME = bankruptcy regime proxy (1 if GCM firm is a U.K. firm and 0 if it is U.S.), PRTA = percentile based population relative total assets, BM = book value of assets divided by market capitalisation at the end of the calendar month of audit report publication date, MOM = monthly average of prior 11-months (t-12 to t-2) raw returns, PRCHEAR = percentile based population relative annual change in earnings, PREDGC = GCM expectations dummy calculated using Mutchler (1983) for U.S. and Citron and Taffler (2001) for U.K. (1 if GCM expected, 0 otherwise), DIVID = dividend paid dummy (1 if dividend paid, 0 if nominal or omission), PRZ = population relative financial distress measure computed using Altman (1968) for U.S. firms and Taffler (1984) for U.K. firms, LNCHPRZ = natural log of change in population relative z-score, LNPRLEV = natural log of change in population relative leverage, DELIST = delisting dummy (1 if the firm is delisted for performance reasons within one year of the audit report date, 0 otherwise), BKT = bankruptcy dummy (1 if the firm goes into bankruptcy within one year of the audit report date, 0 otherwise), AUDITOR = audit quality proxy dummy (1 if Big5/Big6, 0 otherwise), and. $\lambda_0 \ldots . \lambda_{13}$ are the regression parameter estimates and $u_i$ is a mean zero stochastic error term.

### 8.4. Additional Tests

I conduct additional analysis to see if my longer-term results are robust to alternative explanations. I specifically control for the level of distress risk, changes in earnings and firms that go bankrupt in the 12-month period subsequent to the publication of the GCM audit report.

### *8.4.1. Controlling for distress risk*

Dichev (1998) finds that firms with a higher distress risk earn reliably lower returns. Panel A of Table 8.2 shows that U.K. GCM firms are significantly more distressed than U.S. GCM firms. For example, mean (median) PRZ (population relative z-score) for U.K. firms is 0.88 (0.94), whereas, similar figures for U.S. firms are 0.80 (0.87). Both mean (median) differences are significant at the 1% level.

To control for differences in the level of distress risk, I match each U.K. GCM firm with two U.S. GCM firms of similar distress risk level (PRZ) and then re-run my longer-term regressions. The mean (median) PRZ for the matched (n=254) U.S. GCM sample is 0.88 (0.94), which is similar to the distress levels of U.K. GCM sample to two decimal places. The regression results are presented in Panel B of Table 8.7. As can be seen the results are more or less similar to my main (full) results presented in Panel A of the same table. The coefficient on the REGIME variable for BHAR12 (BHAR6) is -0.39 (-0.18), significant at better than the 5% level. Similarly, the BKT and DELIST variables are also highly significant with their signs in the expected direction. The overall model is significant and the explanatory power of the model is 8% (6%). These results demonstrate that the abnormal return differences between the U.S. GCM firms and U.K. GCM firms are not due to the differences in distress levels at the initial GCM stage and confirm the rejection of null hypothesis H15.

### *8.4.2. Controlling for post-earnings announcement drift*

Another possible explanation for the observed differences in post-GCM drift in stock returns between U.S. and U.K. GCM firms could be due to the well-documented post-earnings announcement drift anomaly. Bernard and Thomas (1989) document that

extreme earnings surprises are followed by abnormally low stock returns. Panel A of Table 8.2 also confirms mean (median) differences in the earnings surprise variables (change in earnings (CHEAR) and population relative change in earnings (PRCHEAR)) between the U.S. and the U.K. GCM sample. Hence, I need to control for the possibility that potential systematic differences in the post-earnings announcement drift between the U.K. and U.S. are driving my results.

To control for differences in the post-earnings announcement drift, I follow the same procedure as used in section 8.4.1 above and match each U.K. GCM firm with two U.S. GCM firms which experience a similar earnings change measure (PRCHEAR) and then re-run my longer-term regressions.[62] The mean (median) PRCHEAR for matched (n=254) U.S. GCM sample is 24.05 (9.12), which is similar to the PRCHEAR of U.K. GCM firms (n=127). The mean (median) differences are highly insignificant demonstrating the effectiveness of my matching procedure. The regression results of the matched GCM sample are presented in Panel C of Table 8.7 which again confirms my original findings presented in section 8.3.4. The coefficient on the variable REGIME for BHAR12 (BHAR6) is -0.40 (-0.33), significant at the 1% level. The coefficients on BKT and DELIST variables are also significantly negative as expected. The overall model is significant and the explanatory power of the model is in the range of 8-9%. These results highly support the rejection of null hypothesis H15.

[62] As my BHARs are derived using control firm approach matched on size and book-to-market ratio, I also calculate BHARs matched on size and earnings surprise ratio and then compute the differences in BHARs between the U.S. and U.K. GCM firms. The results are substantively similar to those presented in table 8.6 of this chapter.

After controlling for the earnings surprise, I continue to observe that U.K. GCM firms experience more negative BHARs than U.S. GCM.

### *8.4.3. Controlling for subsequent bankruptcies*

It is possible that my documented results are driven by subsequent bankruptcies of the GCM firms. In addition to the controls for bankruptcy already implemented in my multivariate analyses in panel A of table 8.7, I also eliminate those GCM firms that enter bankruptcy in the 12-month period subsequent to the publication of the GCM audit report month from my sample and re-run my longer-run tests. There are 122 U.S. GCM firms that file for bankruptcy and 19 U.K. GCM firms that enter receivership, administration or creditors voluntary liquidation in the one-year period after the GCM announcement. The regression results presented in Panel D of Table 8.7 are consistent with the tenor of my main results The coefficient on the variable REGIME for BHAR12 (BHAR6) is -0.39 (-0.26), significant at the 1% level. These findings suggest that even after excluding bankrupt firms, U.K. GCM firms have more negative returns than the U.S. GCM firms. This is again consistent with the argument that the GCM announcement has more negative implications in the creditor-biased U.K. bankruptcy regime compared to the debtor-biased regime in the U.S., again leading me to reject the null hypothesis H15.

## 8.5. Summary

This chapter addresses a very important research question regarding the interaction between accounting standards and legal regimes. I examine the information value to investors of the going-concern modified (GCM) audit opinion and compare how the bankruptcy code impacts on this relationship. I compare a debtor-friendly bankruptcy

regime such as the U.S. to a creditor-friendly bankruptcy regime such as the U.K. Whilst the issue of the relevance of the auditor's going-concern opinion to investors has been studied previously in the literature, this question is not fully resolved. Importantly, there has been no study to date which has examined in detail the impact of bankruptcy codes on the value-relevance of the going-concern opinion.

My results show that investors, both in the U.S. and in the U.K., react negatively to the GCM both at the time of the information release and also in the medium-term, clearly demonstrating that the GCM does contain new information of direct relevance to the capital markets. Consistent with my expectations that market reaction to a GCM will be more severe in a creditor-friendly regime than in a debtor-friendly regime because of likely greater loss to investors, both my univariate, although somewhat weak for short-window setting, and my multivariate results demonstrate that U.K. investors react more negatively than investors in the U.S. I also examine the post-GCM drift in abnormal returns documented in chapter 5 for the U.S. GCM sample and extend Taffler, Lu, and Kausar's (2004) work for the U.K. GCM firms. Again, consistent with my expectations, the post-GCM drift is more negative for U.K. GCM firms than for U.S. GCM firms. The relationships between ex post events of bankruptcy and performance delistings (a broader measure of financial distress) are also as expected and highly significant. Overall, the results show that the higher the distress risk the lower the abnormal returns and such abnormal returns are further significantly lower for GCM firms operating in the creditor-friendly bankruptcy regime of the U.K. than in the debtor-friendly regime of the U.S.

The empirical evidence presented in this chapter is novel to the accounting literature and has not been documented before. These results have important implications. In the final chapter I summarise the findings of my thesis, discuss its implications and limitations, bring out its principal contribution to the academic literature and present suggestions for further work.

# CHAPTER 9

# CONLUSIONS, LIMITATIONS AND FURTHER WORK

## 9.1. Introduction

This study is primarily concerned with examining the market underreaction hypothesis to bad and good news events in the financial distress domain. Additionally, I extend my work to investigate the market underreaction phenomenon conditional on the underlying bankruptcy regime of the institutional environment. In undertaking this research, I first conducted a critical review of the literature, and then, drawing on this, developed fifteen testable hypotheses from my research questions. Appropriate empirical methodologies are then established to test the hypotheses formally adopting a capital market-based information assimilation perspective. The first empirical chapter of the thesis, chapter 5, explores longer-term market reaction to going-concern modified audit report disclosures (bad news) and their subsequent withdrawal (good news), chapters 6 and 7 conduct additional tests to search for alternative explanations for the market underreaction phenomenon to bad news and chapter 8 presents evidence on how divergent bankruptcy codes impact on investor response to the going-concern modified audit report signal in two institutional environments.

In this final chapter of my thesis, the next section first summarises and discusses my main empirical findings along with their implications and the contributions of my thesis to the literature and related public policy issues. Section 3 discusses some limitations of my research and the final section outlines possible future developments of my work.

## 9.2. Summary, Implications of Results and Contributions

The seminal market efficiency paradigm in finance is being increasingly challenged by evidence apparently inconsistent with its predictions. Such "anomalies" tend to show that the market does not fully incorporate information upon its release in an unbiased way. Recent literature in finance identifies two potential types of anomalous market reaction to news disclosures, overreaction, and underreaction. The overreaction phenomenon finds little empirical support but market underreaction, on the other hand, appears quite robust, particularly in the case of bad news which the market appears to take time to process in many situations. My thesis explores these issues.

The first part of my thesis tests the hypothesis that if investors rationally incorporate new pessimistic (optimistic) information then after controlling for risk, bad (good) news firms will not under- (over-) react. I test this hypothesis in the going-concern modified audit report disclosure domain. Going-concern opinions offer an excellent test of the underreaction proposition as such information releases are associated with acute psychological stress and where a clear distinction between bad and good news can easily be made by considering the parallel case of going-concern withdrawal events.

Chapters 5, 6, and 7 address my first empirical issue 'Does the market underreact to bad and good news in the financial distress domain?' Research to date in this area has been scarce and new evidence is needed to see if investors fail to recognize the downside risk associated with bad news relative to good news. My GCM firm sample offers a very appropriate test for this issue as the implications of bad news and good news are very different in this key financial distress context.

The first empirical chapter of my thesis examines the prior price behaviour and stock returns following first-time going-concern modified opinion audit report publication and its subsequent withdrawal which are fundamental, mandatory, independent, public-domain news events, together with the stock holding patterns and trading responses to this news of different classes of investor. A web-based procedure is used to identify my relatively large sample of 845 firms with first-time GCMs published from 1994 to 2002. My results demonstrate differential market reaction to such public domain bad (GCM) and good (GCM withdrawal) news events. I find negative stock price reaction following a GCM announcement lasts for a year, and is around -16%, indicating clear market underreaction to this bad news event. Conversely, no similar abnormal return pattern is found after GCM withdrawals (good news), as predicted by theory. Additional analyses reveal that underperformance is restricted to GCM firms with negative earnings surprise, consistent with the market focusing on earnings while ignoring the full implications of the GCM signal. On the other hand, I find that the good news about firms' future prospects, as highlighted by a withdrawn going-concern opinion, is correctly anticipated by the market in the period leading up to the next audit report publication date.

Overall, my results cannot be explained by existing anomalies documented in the literature. Other issues, such as problems related to abnormal return measurement, generally arise in long-term studies with time horizons of three years or more (Ang and Zhang, 2004). Here, I restrict my analysis to the one-year longer-term time horizon. Similarly, a bad model problem cannot explain my results because my GCM

firms significantly underperform even on a raw return basis in good market conditions.

Nonetheless, I find that high transaction costs associated with trading in my sample stocks render arbitrage opportunities unprofitable and very risky for rational investors. Additionally, these market frictions could be a reason for the persistence of my strong post-GCM announcement drift. However, they cannot explain the existence of this drift in the first place, and its asymmetric nature.

Once a researcher fails to identify any rational or systematic risk-based explanation for anomalous results, such as mine, there is a plethora of potential behavioural explanations available. I try to limit the range of behavioural stories which can be fitted to my findings. Taffler, Lu, and Kausar (2004) use Lee's (2001) argument that price discovery is a complex process to argue that because GC firms are highly financially distressed, their underlying fundamental value might be difficult to measure. This argument seems to be appealing as 44% of my GC firms are delisted in the first year alone due to financial distress reasons. Similarly, Hong, Lim, and Stein (2000) argue that if firms are small and poorly followed then managers have less incentive to bring investors up-to-date quickly, consequently pessimistic information diffuses only gradually across the investing public. This explanation might be more likely when managers have some adverse private information for their firms, but in my going-concern context investors are essentially dealing with a freely available public-domain mandated news event.

However, my thesis shows that investors have problems dealing with bad news but not with good news. Two behavioural explanations are consistent with my results. The first one relates to mental accounting and investor inability to realise losses, Shefrin and Statman's (1985) disposition effect, drawn from Kahneman and Tversky's (1979) prospect theory. The second explanation, proposed by Taffler, Lu, and Kausar (2004), is that of market *denial* of the bad news conveyed by the GCM releases, the premise of which lies in the domains of psychoanalysis. In the psychoanalytic literature it is argued that this defence mechanism pushes the painful thoughts or experiences out of conscious awareness because they have become too painful to handle consciously. Though most of the work done in this area is either consultancy work or action research, Obholzer and Roberts (1994) present an account of such work which shows that individuals working in groups, organisations or by themselves exhibit various patterns of defence mechanisms, *denial* being a most common one used to defend them from feeling anxious (depressive position). Also Brown (1997) points out that individuals and firm managers seek to preserve their self-esteem and ameliorate anxiety through the use of such mental defence mechanisms as denial, rationalisation, and self-aggrandisement. So, there is a possibility that investors might also be suffering from such mechanisms as opposed to cognitive biases and heuristics drawn on in traditional behavioural finance. This explanation will also be more consistent with the phenomenon of market underreaction being more pronounced to bad news while no abnormal response to good news.

Although the above two explanations are drawn from different psychological theories, their message seems to be the same - bad news, as opposed to good news, is difficult

to digest. Importantly, no such distinction is drawn in the behavioural finance models of Daniel, Hershleifer, and Subrahmanyam (1998), Barberis, Shleifer, and Vishny (1998), and Hong and Stein (1999). Even my empirical evidence of market underraction to bad news is not consistent with these models.

An additional contribution of my thesis is to explore the trading patterns of different investor classes in response to the going-concern opinion. I find that institutional holdings in GCM firms decline by around 35% over the 9-quarter period centred on the GCM announcement quarter from 17% to 11%. In contrast, insider holdings do not change significantly, averaging around 15% throughout. By deduction, retail investors would appear to increase their holdings over this period in these stocks from around 68% to 74%. Furthermore, they account for most of the trading activity. When I analyse the trading activity of the three classes of stockholders based on ex post outcome, I find institutions substantially reduce their holdings in the GCM delisted and bankrupt (most likely to lead to losses) stock category (17% to 5%), whereas, by deduction, retail investors appear to increase their holdings in these stock (70% to 83%) over the 9-quarter period. On this basis, I have evidence that institutional investors are less prone to behavioural biases in assimilating bad news of this nature. My evidence of stock mispricing and extended post-GC-drift might then be explained by a limits-to-arbitrage argument with naïve (retail) investors, being particularly prone to behavioural bias, keeping stock prices artificially high by trading inappropriately in these stocks.

Based on my results and the growing empirical evidence (Dichev and Piotroski, 2001; Taffler, Lu and Kausar, 2004; and Eisdorfer, 2004) one can speculate that such stock

market anomalies are likely to arise in circumstances where the firms in question are financially distressed and further, due to limits to arbitrage constraints investment from institutional (also perceived to be rational) investors is low. In such situations naïve (retail) investors do not appear to act rationally and misprice such firms. This shows that we certainly have a class of investors who are irrational and exhibit behaviour which causes systematic mispricing contrary to that which the efficient market hypothesis suggests.

Nevertheless, whatever the explanations for my anomalous results, I find that going-concern modified audit reports, indicating increased risk of financial distress, lead to significant market underreaction for up to a year following the bad news disclosure event. Conversely, I do not find any evidence suggesting that the market is delayed in its reaction to GCM audit reports (good news) which highlight improvement in firm financial health, and thus clearly anticipates this good news fully. My results have public policy implications since I have shown that despite clear messages being conveyed by auditors to investors, their information is not being fully impounded by the market on a timely basis leading to trades taking place at prices apparently inconsistent with fair value.

Chapter 8 of my thesis extends my work to empirically investigate the market underreaction phenomenon conditional on the underlying bankruptcy regime of the institutional environment. Specifically, I explore the market response to the information content of closely related going-concern modified audit report disclosures (bad news) conditional on the underlying bankruptcy codes in very similar institutional and market environments differing only in the nature of bankruptcy

regimes. More specifically, I work with the debtor-friendly U.S. and the creditor-friendly U.K. legal regimes. I hypothesise that investors in a creditor-friendly bankruptcy regime (the U.K.) will react more adversely to the publication of a first-time going-concern modified audit report indicating increased risk of loss than do investors in a debtor-friendly bankruptcy regime (the U.S.). This is because of a remarkable divergence across the bankruptcy codes of these two different countries with regard to the rights of claimholders in the event of a default on debt contracts (e.g., Franks et al., 1996; La Porta et al., 1997). The idea is to test whether there is any difference in investor response to similar bad news signals highlighting financial distress across different institutional environments.

The results of this part of my thesis are presented in chapter 8 which shows that investors, both in the U.S. and in the U.K., react negatively to the GCM both at the time of the information release and also in the longer-term, clearly demonstrating that the GCM does contain new information of direct relevance to the capital markets. Consistent with my expectation that market reaction to a GCM will be more severe in a creditor-friendly regime than in a debtor-friendly regime, because of a likely greater loss to investors, both my univariate and multivariate results demonstrate that U.K. investors react more negatively than investors in the U.S. I also examine the post-GCM drift in abnormal returns documented in chapter 6 for the U.S. GCM sample and extend Taffler, Lu, and Kausar's (2004) work for the U.K. GCM firms. Again, consistent with my expectations, the post-GCM drift is more negative for U.K. GCM firms than for U.S. GCM firms. I find that, as hypothesised, investors in a creditor-friendly regime (the U.K.) react more adversely, -31%, than investors in a debtor-friendly regime (the U.S.), -18%, in the eight year time-period (1995-2002).

These findings provide new insight into the informativeness of the going-concern opinion to capital market participants. First, I show that investors both in the U.K. and in the U.S. find the going-concern modified (GCM) audit opinion to have informational value. There is a significant negative market reaction to the GCM opinion in both institutional environments around the days that it is announced. Next, I observe a differential market response to the GCM announcement between the U.K. and the U.S.. My results are robust to: (1) controls for other factors that may be correlated with the market's reaction to the GCM announcement; (2) matching U.K. and U.S. firms on firm performance and distress levels; and (3) various time period horizons. Despite a battery of sensitivity tests, the tenor of my results remains the same. Overall, my results consistently document that U.K. firms exhibit more severe negative market reaction to the GCM announcement than U.S. firms. This is consistent with my expectations that despite the uniformity of this negative public signal, equity market participants will react more adversely to this signal in a creditor-friendly bankruptcy regime than in a debtor-friendly bankruptcy regime.

The findings of the second part of my thesis contribute to the literature and ongoing discussions amongst standard-setters and regulators as follows. First, I inject empirical evidence into discussions surrounding the convergence of financial reporting and auditing standards around the world. Underlying much of these discussions is an implicit notion that a single set of accounting standards will lead to uniform accounting and auditing practices and thus calibrate the information contained in financial statements across the world to provide consistent, comparable, relevant, and reliable information. This, in turn, will promote the efficient functioning

of the global capital markets. Examining the auditor's going-concern opinion across two major economies where this information carries very similar meanings, I show that its information usefulness to market participants varies with bankruptcy codes that assign differential claimholder rights. Thus, these findings draw attention to the importance of considering differential legal regimes in discussing the harmonisation of accounting and auditing standards. One possible policy implication for international standard-setters is that they may need to consider how the different legal regimes across countries might interact with the global accounting standards to provide value-relevant accounting information to the capital markets.

Second, I provide further evidence on the value of the audit opinion. I document that the going-concern opinion contains information that is useful to investors in pricing securities. The contribution follows because prior studies examining this research question present conflicting findings.

Finally, these findings contribute to the recent growth in the stream of literature which examines international accounting differences (e.g., Ball, Kothari and Robin, 2000; Ball, Robin and Wu, 2003). I exploit a unique setting in which the accounting standard that prescribes the production of the accounting information (i.e., the auditor's going-concern opinion) is relatively constant in two different countries that share similar political influence and market determination of financial reporting (i.e., both the U.K. and U.S. are often classified together in the one group as common-law countries) (Ball, Kothari and Robin, 2000). In response to Holthausen's (2003) call for further refinement in the research designs of studies conducting cross-country comparisons, I attempt to conduct a natural experiment where fewer factors are

changing in order to determine which institutions are more important determinants of the value-relevance of accounting information.

Overall, my thesis makes important theoretical and empirical contributions to the behavioural finance, market pricing, and accounting literature in the bad news disclosure domain.

## 9.3. Limitations

1. Since my research cases are based on firms receiving first-time going-concern modified audit reports (GCM cases), any conclusion about the auditors' disclosures should only be applied to this limited area. I have not addressed the different but related issue of the auditor's decision to give a GCM in the first place.

2. In an empirical test, it is not possible to completely accept or reject the various explanations provided by the behavioural finance/psychology literature because in such studies it becomes quite difficult to explicitly test a particular behavioural trait. Only speculative conclusions can be drawn.

3. Tests of zero abnormal returns (market efficiency) suffer from a joint-hypothesis problem. It is quite possible that my findings are due to lack of control for risk which is not adequately captured by control factors employed in this study.

4. The study covers a relatively short period (1994/5 to 2002). My findings could hence be specific to this period and may not be applicable to other periods.

5. This study is based on the U.S. and U.K. data only and therefore the results could be specific to these environments only.

6. My study is primarily based on analysing longer-term (up to 12-months) returns, excluding the event month (audit report publication month) itself. Such an approach biases against finding any abnormal returns. This is because a) the initial market reaction to the going-concern opinion event is ignored, and b) any temporary, spurious differences in market reactions to my going-concern opinion event in the U.S. and the U.K. should be eliminated in the long-run.

7. Other less serious limitations are the use of a two factor control firm approach, equally weighted portfolios, annual rebalancing, and use of standardised databases.

## 9.4. Further Work

The strong and unambiguous results of my thesis confirm the richness of the reporting environment I address. This brings together accounting and auditing issues, behavioural finance considerations, capital market theory, and the role of institutional environments on accounting information. These issues have crucial public policy implications and also shed light on investor behaviour in such circumstances.

Building on the results of my thesis, further work in each of these areas has the potential to contribute further to knowledge and theory development.

For example, I have shown that market underreacts to going-concern modified audit report disclosures. It might be important to see how other market participants react to this bad news event. Specifically, whether analysts, as the prime information intermediaries, view going-concern opinions as informationally relevant as measured by basic mention, earnings revisions, change in recommendation, coverage/non-coverage etc. A content analysis approach may well be used in exploring how the analyst respond to the audit report or anticipate its content. A parallel thrust could be to explore the market reaction to such analysts' reports. Here the contribution to the literature is the linking of the analyst to the actual going-concern opinion event.

In this thesis, I explore the impact of bankruptcy codes on the informativeness of accounting information in the U.S. and the U.K. Another possible extension of my work is to extend this work into other legal jurisdictions, including civil-law countries. La Porta et al. (1997) shows that common-law countries generally have the strongest and French civil-law countries have the weakest, legal protection of investors. A study along these lines can further educate us on the interaction between accounting information and legal regimes internationally.

Finally, another important dimension which could be pursued is to explore corporate governance issues for my GCM sample. There is very little that we know about how management and auditors deal with such bad news reporting. There are several factors that could influence the disclosure behaviour of both directors and auditors. The idea

is to see whether a robust corporate governance structure is associated with higher quality going-concern uncertainty disclosures. Additionally, an intertemporal comparison of pre-Sarbanes Oxley and post-Sarbanes Oxley going-concern firms could also provide additional insights into the effectiveness of such corporate governance mechanisms. A capital market dimension of such issues is also necessary to assess how capital markets respond to these changes, only making such contributions richer.

All of the above-mentioned extensions of my research are original and if pursued have the potential to significantly contribute further to the accounting and finance literatures. The results of these studies might also provide additional guidance on appropriate public policy issues in a global context.

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# Appendix 1

**First time firm going-concern modified audit report post-announcement month cumulative abnormal returns derived using control firm method**
This table presents cumulative abnormal returns (CARs) for my population of 845 non-finance industry firms fully listed on the NYSE, AMEX or NADSAQ which published a going-concern modified audit report (GCM) for the first time between 01.01.1994 and 31.12.2002. The 12-month period reported commences on the first day of the month immediately following the going-concern modified audit report release month. Returns earned by delisted firms are represented by the equivalent monthly return on the S&P 600 Small Cap. Index. This table provides mean and median CARs using a control firm benchmark.

The cumulative abnormal return for firm i is derived by:

$$CAR_{in} = \sum_{t=1}^{n} AR_{it}$$

where $AR_{it} = R_{it} - E(R_{it})$ is the abnormal return on firm i in month t (t=1, 2...n), $R_{it}$ is the return on firm i in month t (t=1, 2...n), and $E(R_{it})$ is the expected return of firm i in month t.

| Month | Mean CAR | t-value | Median CAR | Wilcoxon z-value | Sign test z-value |
|---|---|---|---|---|---|
| 1 | -0.03 | -1.69 | -0.05 | -3.40 | -4.45 |
| 2 | -0.05 | -1.89 | -0.05 | -2.83 | -2.13 |
| 3 | -0.07 | -2.32 | -0.08 | -3.43 | -3.10 |
| 4 | -0.08 | -2.37 | -0.11 | -3.55 | -3.37 |
| 5 | -0.12 | -3.27 | -0.13 | -3.94 | -3.16 |
| 6 | -0.14 | -3.47 | -0.16 | -4.08 | -4.54 |
| 7 | -0.13 | -3.19 | -0.19 | -3.81 | -4.75 |
| 8 | -0.16 | -3.68 | -0.21 | -4.27 | -4.33 |
| 9 | -0.15 | -3.30 | -0.21 | -3.84 | -3.78 |
| 10 | -0.20 | -3.98 | -0.17 | -3.97 | -3.37 |
| 11 | -0.20 | -3.74 | -0.21 | -3.91 | -3.65 |
| 12 | -0.21 | -3.88 | -0.20 | -3.91 | -3.85 |

# Appendix 2

**First time firm going-concern modified audit report post-announcement month buy-and-hold abnormal returns derived using matched portfolio method**

This table presents buy-and-hold abnormal returns (BHARs) for my population of 845 non-finance industry firms fully listed on the NYSE, AMEX or NADSAQ which published a going-concern modified audit report (GCM) for the first time between 01.01.1994 and 31.12.2002. The 12-month period reported commences on the first day of the month immediately following the going-concern modified audit report release month. Returns earned by delisted firms are represented by the equivalent monthly return on the S&P 600 Small Cap. Index. The table provides mean and median BHARs using a three-factor matched portfolio reference benchmark.

The buy-and-hold abnormal return for firm i is derived by:

$$BHAR_{in} = \prod_{t=1}^{n}[1 + R_{it}] - \prod_{t=1}^{n}[1 + E(R_{it})]$$

where $R_{it}$ is the return on firm i in month t (t=1, 2...n) and $E(R_{it})$ is the expected return of firm i in month t.

| Month | Mean BHAR | t-value | Median BHAR | Wilcoxon z-value | Sign test z-value |
|---|---|---|---|---|---|
| 1 | -0.02 | -1.33 | -0.08 | -5.71 | -7.43 |
| 2 | -0.04 | -2.11 | -0.13 | -6.52 | -7.91 |
| 3 | -0.06 | -2.56 | -0.16 | -7.86 | -9.91 |
| 4 | -0.07 | -3.11 | -0.21 | -8.80 | -10.32 |
| 5 | -0.09 | -3.63 | -0.23 | -9.09 | -9.84 |
| 6 | -0.11 | -4.39 | -0.26 | -10.23 | -10.94 |
| 7 | -0.14 | -5.36 | -0.28 | -11.00 | -11.83 |
| 8 | -0.16 | -5.56 | -0.33 | -11.37 | -11.90 |
| 9 | -0.17 | -5.11 | -0.36 | -11.53 | -11.97 |
| 10 | -0.19 | -5.29 | -0.39 | -11.95 | -12.93 |
| 11 | -0.18 | -4.22 | -0.40 | -12.16 | -12.80 |
| 12 | -0.17 | -3.55 | -0.43 | -12.17 | -13.00 |

Benchmark portfolios are derived using three firm characteristics, size, book-to-market and momentum. Sixty four portfolios are formed on a monthly basis from the complete population of non-finance industry firms fully listed on the NYSE, AMEX or NASDAQ. All such stocks are ranked independently on market capitalisation, book-to-market ratio and momentum into quartiles. Momentum is average monthly return over the previous 11 months from month t-12 to month t-2, where t=0 is the audit report release month.

Abnormal returns are derived by assigning each sample firm to one of the 64 matched portfolios formed previously for the appropriate month using its market capitalisation, book-to-market ratio and prior returns history. Abnormal returns are then calculated by comparing the returns of the sample firm from the start of the calendar month after the GCM date with that of the matched portfolio on a monthly basis.

# Appendix 3

**First time firm going-concern modified audit report post-announcement month buy-and-hold abnormal returns derived using four factor model**
This table presents buy-and-hold abnormal returns (BHARs) for my population of 527 non-finance industry firms fully listed on the NYSE, AMEX or NADSAQ which published a going-concern modified audit report (GCM) for the first time between 01.01.1994 and 31.12.2002. The 12-month period reported commences on the first day of the month immediately following the going-concern modified audit report release month. Returns earned by delisted firms are represented by the equivalent monthly return on the S&P 600 Small Cap. Index. The table provides mean and median BHARs using a four-factor model.

The buy-and-hold abnormal return for firm i is derived by:

$$BHAR_{in} = \prod_{t=1}^{n}[1 + R_{it}] - \prod_{t=1}^{n}[1 + E(R_{it})]$$

where $R_{it}$ is the return on firm i in month t (t=1, 2...n) and $E(R_{it})$ is the expected return of firm i in month t.

| Month | Mean BHAR | t-value | Median BHAR | Wilcoxon z-value | Sign test z-value |
|---|---|---|---|---|---|
| 1 | -0.04 | -2.62 | -0.07 | -3.54 | -3.31 |
| 2 | -0.05 | -2.30 | -0.14 | -4.15 | -3.92 |
| 3 | -0.07 | -2.82 | -0.17 | -4.86 | -4.62 |
| 4 | -0.07 | -2.11 | -0.16 | -4.33 | -4.09 |
| 5 | -0.07 | -2.09 | -0.19 | -4.42 | -4.18 |
| 6 | -0.10 | -2.76 | -0.22 | -4.24 | -4.01 |
| 7 | -0.12 | -3.18 | -0.22 | -5.64 | -5.41 |
| 8 | -0.15 | -3.53 | -0.23 | -5.94 | -5.71 |
| 9 | -0.14 | -2.94 | -0.24 | -4.36 | -4.13 |
| 10 | -0.15 | -2.93 | -0.25 | -4.45 | -4.22 |
| 11 | -0.12 | -2.07 | -0.25 | -4.54 | -4.30 |
| 12 | -0.10 | -1.68 | -0.28 | -4.10 | -3.87 |

The four-factor model that I use is the Fama-French three-factor model augmented by Carhart's (1997) momentum factor. The model is presented as follows:-

$$R_{it} - R_{ft} = a + b(R_{mt} - R_{ft}) + sSMB_t + hHML_t + uUMD_t + e_{it}$$

Where ($R_{mt}$-$R_{ft}$) is the market factor, constructed by subtracting the T-bill return from the value-weighted market returns. SMB (Small minus Big) is the size factor, constructed by taking the return on a portfolio of small stocks minus the return on a portfolio of big stocks. HML (High minus Low) is the book-to-market factor, formed by taking the return on a portfolio of value stocks (with high book-to-market ratios) and subtracting the return on a portfolio of growth stocks (with low book-to-market ratios). UMD (Up minus Down) is the average return on the two high prior return portfolios minus the average return on the two low prior return portfolios. $a_i$ is the intercept, $b_i$, $s_i$, $h_i$, $u_i$ are the coefficients and $e_i$ is the stochastic error term. Rm-Rf, SMB, HML, and UMD are obtained from Kenneth R. French's online data library on U.S. equity returns.

# Appendix 4

## First Time Going-concern Modified Audit Report Insider and Institutional Holding Patterns (Constant Sample)

This table presents mean and median percentage institutional, insider, and, by deduction, retail holding patterns for my 240 first-time going-concern audit report (GC) non-finance, non-utility industry firms listed on the NYSE, AMEX or NASDAQ with such audit opinions published between 01.01.94 and 31.12.2002 having holding data in all the 9 quarters under investigation. Results for 9 quarters are provided, four quarters prior to the GC quarter, four quarters subsequent to, and the GC quarter itself (0). Total numbers of cases with available data in each quarter are also shown. Retail holding are calculated by subtracting the respective institutional and insider percentages for those stocks from 100%.

| Quarter | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|
| *Institutional* | | | | | | | | | |
| Mean (%) | 15.8 | 15.0 | 13.9 | 13.7 | 13.1 | 12.5 | 12.0 | 11.5 | 11.6 |
| Median (%) | 10.1 | 9.3 | 7.9 | 7.9 | 7.2 | 6.9 | 6.1 | 5.6 | 4.9 |
| N | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 |
| *Insider* | | | | | | | | | |
| Mean (%) | 15.1 | 14.8 | 14.9 | 14.9 | 15.2 | 15.1 | 15.3 | 15.7 | 15.6 |
| Median (%) | 9.4 | 9.0 | 9.2 | 10.1 | 9.9 | 9.9 | 10.0 | 9.9 | 10.3 |
| N | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 |
| *Retail (by deduction)* | | | | | | | | | |
| Mean (%) | 69.1 | 70.2 | 71.1 | 71.4 | 71.7 | 72.4 | 72.7 | 72.8 | 72.8 |
| Median (%) | 72.5 | 73.4 | 73.8 | 74.8 | 75.2 | 76.7 | 76.8 | 77.4 | 78.2 |
| N | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 |