Research Collection School Of Accountancy   School of Accountancy

6-2007

Systematic Share Price Fluctuations after Bankruptcy Filings and the Investors Who Drive Them

Mark C. Dawkins
University of Georgia

Nilabhra BHATTACHARYA
Singapore Management University, neilb@smu.edu.sg

Linda Smith Bamber
University of Georgia

Citation

Systematic Share Price Fluctuations after Bankruptcy Filings and the Investors Who Drive Them

Mark C. Dawkins
Terry College of Business
University of Georgia
Athens, GA 30602-6252
mdawkins@terry.uga.edu
706-542-3632

Nilabhra Bhattacharya[**]
Cox School of Business
Southern Methodist University
Dallas, TX 75275-0333
neilb@mail.cox.smu.edu
214-768-3082

Linda Smith Bamber
Terry College of Business
University of Georgia
Athens, GA 30602-6252
lbamber@terry.uga.edu
706-542-3501

June, 2005

[**] Corresponding author: Cox School of Business, Southern Methodist University, 6212 Bishop Blvd., Dallas, TX 75275-0333. Phone: (214) 768-3082; fax: (214) 768-4099; e-mail: **neilb@mail.cox.smu.edu**

Systematic Share Price Fluctuations after Bankruptcy
Filings and the Investors Who Drive Them

Abstract

This study presents empirical evidence on the pattern of returns and investor trades around and shortly after Chapter 11 bankruptcy petition filings. Consistent with prior research, we find that share prices plunge before and at the bankruptcy filing date. Beginning in the 1990's, however, firms often continued to trade on the major national exchanges *after* filing for bankruptcy. Thus, our primary contribution is new evidence on the patterns of returns and trades *after* bankruptcy filings.

We document a systematic pattern of returns after bankruptcy filings -- the filing period price plunge is followed by a price runup in the immediate post-filing period which turns out to be short-lived. Thus, we find two post-filing reversals: (1) the price plunge in the –1 to +1 filing period is inversely associated with abnormal returns in the day +2 to +5 post-filing period, and (2) returns cumulated over days +2 to +5 are negatively associated with subsequent returns cumulated from days +6 to +10. These reversals are not attributable to bid-ask bounce, and they hold after controlling for various factors associated with post-filing returns (firm size, financial condition, use of debtor-in-possession financing, use of "prepackaged" filings). Detailed analysis of investor trades suggests these reversals are attributable to the activities of large traders, not to small, arguably less sophisticated traders.

I.   Introduction

Bankruptcy filings are significant economic events. Prior research on the market reaction to bankruptcy filings reports steeply plunging prices before and at the bankruptcy filing date (e.g., Clark and Weinstein (1983), Lang and Stulz (1992), Datta and Iskander-Datta (1995)). Beginning in the 1990's, firms often continued to trade on the major national exchanges (NYSE, AMEX, Nasdaq) even after filing for bankruptcy. For example, firms like Fruit of the Loom, K-Mart, Leslie Fay, Owens Corning, and UAL (United Airlines) all continued trading on major exchanges for weeks after filing for bankruptcy. However, we know little about the behavior of prices *after* bankruptcy filings, because until the mid-1980's, firms were usually delisted at or shortly after the bankruptcy filing date.[1] Consequently, prior research focused on the reaction to the bankruptcy filing itself, and was unable to probe the pattern of post-filing returns or trading activity shortly after the filing. We address this void in the literature by providing new evidence on the pattern of returns and investor trades around and shortly after Chapter 11 bankruptcy petition filings.

The study's evidence is of interest for several reasons. First, given the economic significance of the bankruptcy event and the recent innovation that firms continue to trade after filing for bankruptcy, evidence on post-filing returns and insight into who trades in bankrupt firms is clearly of interest. Second, it is not obvious what, if any, pattern post-filing returns will take. Prior research documents that the market often either underreacts or overreacts to corporate announcements. For example, prices underreact (as evidenced by post-announcement drift) to announcements of earnings (e.g., Freeman and Tse, 1989; Bernard and Thomas 1990; Mendenhall 1991), dividend changes (e.g., Michaely, Thaler, and Womack 1995), analyst

---

[1] Only 11 of Clark and Weinstein's (1983) sample firms continued trading after filing for bankruptcy in the 1962-1979 period, and just 29 of Datta and Iskander-Datta's (1995) sample firms still traded after filing for bankruptcy from 1980-1989.

reports (e.g., Womack 1996), stock splits (e.g., Ikenberry, Rankine, and Stice 1996; Ikenberry and Ramnath 2002), announcements of insider trades (e.g., Lakonishok and Lee 2001), and repurchases of "value stocks" (e.g., Ikenberry, Lakonishok, and Vermalean 1995). These corporate announcements aggregate into single summary statistics a large amount of underlying detail about the firm's past operations and future prospects. Market underreactions to these kinds of announcements are consistent with evidence that people tend to underweight abstract statistical information that is less salient but nonetheless highly relevant because it summarizes a large amount of underlying data (Odean 1998; Bloomfield, Libby, and Nelson 2000).

Conversely, evidence that people overreact to salient, anecdotal, extreme information (e.g., Kahneman and Tversky 1973, Griffin and Tversky 1992) is consistent with prior finance research documenting overreactions to relatively uncommon and attention-grabbing news stories. For example, prior research documents overreactions (as evidenced by price reversals) to *Wall Street Journal* "Heard on the Street" buy recommendations (Liu, Smith, and Syed 1990), recommendations made on the *Wall Street Week* TV show (Pari 1987), inclusion as one of the *Wall Street Journal's* "Pros' Picks" (Barber and Loeffler 1993), and news of the market crash in 1987.[2] However, Cox and Peterson (1994) argue that bid-ask bounce could account for the modest price reversals (less than 2%) observed in the studies that document short-term reversals. This leads them to question whether the documented reversals truly reflect market overreactions. In our view, prior research is inconclusive on whether the market actually overreacts to unusual and salient

---

[2] Evidence on the market reaction to news that a firm will be included in the S&P 500 is mixed -- Harris and Gurel (1986) and Lamourex and Wansley (1987) find a reversal, but Schleifer (1986) and Dhillon and Johnson (1991) do not.

information events.[3] Bankruptcy petition filings, which are unusual and dramatic news events that are associated with large price changes, provide a powerful natural setting for investigating possible reversals.

The third reason our study is of interest is that our investigation of investors' reactions to bankruptcy filings spans periods of both bull and bear markets. Recent research suggests that investors' reactions to salient events may vary depending upon whether the market has been booming or declining. For example, Loughran and Ritter (2004) show that the positive first day returns after IPOs are on average much larger during the market bubble period than either before or after the bubble, and that reversals occur during the bubble but not before the bubble period. The authors acknowledge that this pattern is "consistent with the idea that overoptimistic investor sentiment temporarily inflated the market price on these IPOs" (Loughran and Ritter 2004, 30-31).[4] Demers and Lev (2001) show that the market favorably values Internet firms' aggressive cash and marketing expenditures during the bubble period, but not after the bubble period, while Bryant, Henning, and Shaw (2003) conclude that the market prices management-issued non-GAAP pro forma earnings numbers in the 1990s, but not in 2000 and later. Consequently, in addition to examining the 1993-2003 sample period as a whole, we also partition our sample into bankruptcies filed during the booming 1990s, versus those filed during the post-

---

[3] Several prior studies that did not tie price reversals directly to specific information events nonetheless interpret their results as evidence of overreactions. For example, using CRSP monthly returns, DeBondt and Thaler (1985) document price reversals for stocks that experience extreme gains or losses. Their study, and subsequent related long-window studies (e.g., DeBondt and Thaler 1987, Chopra, Lakonishok, and Ritter 1992, Rozeff and Zaman 1998), do not examine the market's reaction to specific information releases, *per se*. Similarly, several short-window studies that do not focus on distinct information events interpret their evidence as supporting market overreaction. For example, Brown, Harlow, and Tinic (1988), Atkins and Dyl (1990), Bremer and Sweeney (1991), Bremer, Hiraki, and Sweeney (1997), and Fung, Mok, and Lam (2000) report quite modest price reversals after (extreme) one-day negative abnormal returns. None of these studies link the extreme price changes with specific information events, so it is difficult to interpret their results as evidence that the market overreacts to specific information. Even to the extent that these large price changes are responses to firm-specific information, they reflect a wide variety of economic events (e.g., mergers, dividend changes, unexpected operating results), and any propensity toward overreaction may differ across heterogeneous events.

[4] In a similar vein, Loughran and Ritter (2002) also document greater post-IPO runups after a period of market increases than after a period of market decreases.

millennium bust, in order to determine whether the pattern of post-filing returns differs across the two periods.

We identify 272 firms that filed bankruptcy petitions from 1993 to 2003, and for which CRSP or the Trades and Quotes (TAQ) database records price data from an actual trade on the day after the bankruptcy filing date. Consistent with Clark and Weinstein (1983), Lang and Stulz (1992), and Datta and Iskander-Datta (1995), we find that share prices plunge before and during the bankruptcy filing period.

We contribute beyond this prior literature by providing new evidence on the patterns of returns and trading *after* bankruptcy filings. We begin by documenting systematic patterns of post-filing returns after bankruptcies. Specifically, we find that the filing period price plunge is followed by a price runup in the immediate post-filing period that turns out to be short-lived. Thus, we find evidence of two post-filing reversals. First, we show that the price plunge in the −1 to +1 filing period is inversely associated with abnormal returns in the day +2 to +5 post-filing period, even after controlling for other factors associated with post-filing returns (e.g., firm size, firm financial condition, debtor-in-possession financing, and use of prepackaged bankruptcy filings where the firm and its creditors negotiate the firm's reorganization plan before the filing),. Second, we find that returns cumulated over days +2 to +5 are negatively associated with subsequent returns cumulated from days +6 to +10, which suggests that the day +2 to +5 mean price runup is short-lived and prices plunge again.

Interestingly, supplementary analyses reveal that the (short-lived) day +2 to +5 runup is more pronounced for *larger* and *more heavily-traded* firms. These price fluctuations are inconsistent with efficient assimilation of the information in the bankruptcy filing. In contrast to most of the prior research documenting price reversals, we show that these fluctuations are not attributable to bid-ask bounce, because these two reversals hold even when we calculate returns

using the closing bid or the closing bid/ask midpoint.[5] Further analysis reveals that these reversals are attributable to bankruptcies filed during the bull market from 1993-1999. In contrast, we find no systematic evidence of post-filing price reversals for bankruptcies filed during the 2000-2003 period of general market decline. These results add to the growing evidence that investors' reactions to certain information events appear to be more anomalously optimistic when those events occur in bull markets (e.g., Loughran and Ritter 2002, 2004: Demers and Lev 2001; Bryant, Henning, and Shaw 2003).

We next investigate whether these systematic price fluctuations are attributable to small traders, who Easley and O'Hara (1987), Barber and Odean (2000), and Bhattacharya (2001) argue are less informationally sophisticated. We find no evidence that small traders cause these systematic post-filing price fluctuations. To the contrary, our evidence suggests that these post-filing price fluctuations are primarily attributable to the activities of large traders. This supports Shiller's (1995, 2002) contention as well as Fung, Mok, and Lam's (2000, p. 1200) conjecture that even sophisticated investors and experts are not immune from overreaction.

The remainder of the paper is organized as follows. Section II describes the data and the sample. Section III describes the research design and presents the analysis of abnormal returns around and after the bankruptcy petition filing date. Section IV analyzes investor trades around and after bankruptcy filings to ascertain whether the post-filing price fluctuations documented in Section III are attributable to small traders' activities. Section V concludes.

---

[5] If the number of closing transactions at the time of a bad-news information release is disproportionately at bid prices due to increased selling pressure, and if over the next few days, this imbalance subsides and there is an equal chance of closing at either the bid or ask, this would, on average, create negative returns at the event date and positive returns in the post-event period. This bid-ask bounce can create a spurious apparent reversal that is solely attributable to the mechanics of calculating returns using closing transaction prices.

II.   Data and Sample Selection

We identified Chapter 11 bankrupt firms and their bankruptcy petition filing dates from four sources: (1) New Generation Research's *The Bankruptcy Yearbook & Almanac* (1994-2004 editions), (2) Predicast's *F&S Index of Corporate Changes*, (3) LEXIS, and (4) Thomson Research. Firms retained in the sample have: (1) financial data available on COMPUSTAT as of the fiscal year-end of the year preceding bankruptcy, and (2) closing price, closing bid, and closing ask data available on CRSP or the Trades and Quotes (TAQ) database.   We are interested in post-filing returns and trading. Thus, we require firms to have a closing transaction price from an actual trade the day after the bankruptcy filing, available from CRSP or TAQ.

We identified 272 firms meeting these criteria over the period 1993 to 2003. Most of the bankrupt firms in our sample trade on the Nasdaq (184 of 272 firms, or 67.7 percent). Another group of 73 firms (26.8 percent) trades on the NYSE, and 15 firms (5.5 percent) trade on the AMEX. We find little evidence of clustering in any industry, as the 272 sample firms span 164 four-digit SIC codes, with 9 (3.3 percent) being the maximum number of firms in any single four-digit code.

Our analysis of investor trades around bankruptcy filings uses intraday transactions data obtained from TAQ. We exclude each day's opening trade because it is usually the sum of multiple orders. We also include only trades executed with a "regular sale" condition code between 9:30 a.m. and 4:15 p.m., Eastern Standard Time.[6]

---

[6] Trades are often reported with a short lag (Lee and Ready 1991). Thus, following prior research (e.g., Lee and Radhakrishna 2000) we allow an extra 15 minutes after the closing of the New York Stock Exchange (4:00 p.m., EST) to encompass trades that are reported late.

III.   Patterns of Returns Around and After Bankruptcy Filing Dates

A.   Cross-sectional Mean Abnormal Returns

We estimate market-adjusted abnormal returns (ARs) for five windows: [-10, -6], [-5, -2], [-1, +1], [+2, +5], and [+6, +10]. For the return measures based on closing transaction prices, we compute the AR for a given firm as the percentage difference between the closing stock price on the day preceding the first day of the event window and the closing stock price on the final day of the event window,[7] less the CRSP equally-weighted return for the event window.[8] We begin by reporting the cross-sectional average abnormal returns. Because bankruptcies indicate substantial changes in the firm's business prospects, which may in turn affect the parameters of the firm's stock return distribution, sample variances computed from a pre-filing period may not provide an unbiased estimate of the variance around the filing date. To be conservative, we therefore compute t-statistics based on cross-sectional variances, following prior research on price reactions to bankruptcy filings (e.g., Morse and Shaw 1988) and price reversals (e.g., Bremer and Sweeney 1991, Cox and Peterson 1994).

---

[7] Over 90% of our return data are derived from the major exchanges, as reported by CRSP or TAQ. For firm-specific post-filing windows where neither CRSP nor TAQ report price data, we fill-in data on closing transaction prices, bids, and asks from the Over the Counter Bulletin Board (OTCBB) and from Pink Sheets LLC, in order to guard against survivorship bias. Excluding the OTCBB and Pink Sheet data from the analysis does not affect our conclusions: We still observe a post-filing period price runup after bankruptcies filed in the 1993-1999 period (which subsequently reverses), but no systematic price fluctuations after bankruptcies filed in the 2000-2003 period.

[8] The adjustment for expected returns is less material in short window studies such as ours, than in long window studies. We use market-adjusted returns because identifying a nonevent estimation period is difficult for bankrupt firms, and moreover, Aharony, Jones, and Swary (1980) and McEnally and Todd (1993) conclude that beta is unreliable for bankrupt firms (e.g., beta decreases prior to bankruptcy). The use of market-adjusted returns is also consistent with prior bankruptcy (e.g., Clark and Weinstein 1983; Morse and Shaw 1988; Hubbard and Stephenson 1997) and price reversal research (e.g., DeBondt and Thaler 1985; Park 1995). Our inferences are unaffected if we use mean-adjusted returns or residuals from a standard market model. We use the CRSP equally-weighted return as the measure of the market return to better match our bankrupt firms, which are, on average, smaller than the median firm covered by CRSP. Compounding an equally-weighted index yields a measure of market returns that differs slightly from actual returns that an investor would earn from holding a (value-weighted) market portfolio. As the daily market returns average less than 1/10 of one percent, differences between equal-weighted and value-weighted returns compounded over short three to five day windows are immaterial.

Table 1 presents the mean and median abnormal returns, and the proportion of firms with positive abnormal returns, for each of the five return windows.[9] In addition to reporting abnormal returns based on closing transaction prices, we also present results based on closing bids, and closing bid/ask midpoints, to mitigate the effects of any systematic "bouncing" between bid and ask prices in the closing transaction.[10] Panel A reports abnormal returns around bankruptcy filings during the 1993-1999 bull market, and Panel B reports returns around filings in the more sober 2000-2003 period. Panel C presents results for the entire 1993-2003 period.

Insert Table 1 about here

Panel A of Table 1 shows that for the 1993-1999 period, abnormal returns are significantly negative in the event windows preceding bankruptcy (i.e., [-10,-6] and [-5,-2]). Panel B shows that pre-filing period abnormal returns are either negative or insignificant in the 2000-2003 period. For all three abnormal return measures and in all time periods, we find extremely negative abnormal returns ($\alpha \leq 0.0001$) in the bankruptcy petition filing window (days [-1,+1]).[11] For example, the mean filing period abnormal return based on closing transaction prices is approximately negative 25 percent. In sum, the pre-filing and filing period abnormal returns are negative, consistent with prior research (e.g., Clark and Weinstein 1983; Lang and Stulz 1992; Datta and Iskander-Datta 1995,

---

[9] We obtain similar inferences if we winsorize abnormal returns at 99 percent and 1 percent.

[10] CRSP reports closing bid and ask data for (most of) our sample Nasdaq firms, but CRSP does not report bid-ask data for NYSE and AMEX firms. We recover from the TAQ database most of the bid-ask data missing from CRSP. In addition, for a few of the firms for which we used Pink Sheets data to determine post-filing period returns, Pink Sheets reported closing transaction prices but not bid/ask data, or vice versa. Thus, the number of firms differs very slightly depending on whether abnormal returns are based on closing transaction prices or bid-ask data.

[11] SEC filings indicate the date of the bankruptcy filing, but not the exact time of the filing. Consequently, we define the bankruptcy filing period as days −1 to +1, where day 0 is the Chapter 11 bankruptcy petition filing date. We include day +1 in the bankruptcy filing period window because the stock market closes at 4:00 p.m. EST but the courts do not close until 5:00 p.m. local time, making it possible for firms to file their bankruptcy petition after the market closes on day 0 (i.e., after 4:00 p.m. EST). In such cases, investors cannot trade on the bankruptcy filing information until day +1.

among others). However, prior research has not considered the pattern of returns in the immediate post-filing period. [12]

Panel A of Table 1 shows that for bankruptcies filed during the 1993-1999 bull market, at the mean, nearly one-third of the filing period price plunge reverses in the immediate post-filing period. For example, in the immediate post-bankruptcy day +2 to +5 window, the mean abnormal return based on closing transaction prices is 8 percent. Mean abnormal returns over days +2 to +5 are positive whether based on closing transaction prices ($\alpha < 0.02$), closing bids ($\alpha < 0.02$), or closing bid/ask midpoints ($\alpha < 0.08$). This positive immediate post-filing mean return is attributable to a substantial minority of the firms -- depending on the return measure, between 41 and 47 percent of the firms which have just filed for bankruptcy enjoy positive abnormal returns over the day +2 to +5 period. Supplementary analyses (not tabulated) reveal that firms with positive abnormal returns over days +2 to +5 are on average larger ($\alpha \leq 0.01$) and they are also more actively traded over days -1 to +1, and days +2 to +5 ($\alpha \leq 0.05$), relative to firms with negative abnormal returns over days +2 to +5. Thus, the post-filing price runup in the 1993-1999 period is concentrated among the larger and more actively traded firms. This result is an interesting contrast to prior evidence that other anomalies such as post-earnings announcement drift are generally more pronounced for smaller, less actively-followed firms. Finally, in the 1993-1999 period, the mean abnormal returns over the day +6 to +10 window are not significant, although the median returns are reliably negative. [13]

---

[12] Hubbard and Stephenson (1997) document the *long-term* returns that would accrue to investors who buy shares a full month after firms have filed for bankruptcy. Using a sample of firms that are still trading on the national exchanges (NYSE, AMEX, Nasdaq) a full month after filing for bankruptcy, the authors then cumulate returns over the entire period starting one month *after* the bankruptcy filing date until the day after the reorganization plan is confirmed or the firm announces it is liquidating. Thus, their study provides no evidence on the pattern of the market reaction at the time of or within one month after the bankruptcy filing date.

[13] Untabulated analyses of abnormal returns over subsequent windows extending up to 30 days after the bankruptcy filing date reveal no systematic price fluctuations after the day +6 to +10 period.

Panel B of Table 1 shows that during the more sober 2000-2003 period, all of the post-filing period returns are either negative or insignificant.[14] In contrast to the 1993-1999 period, there is no evidence of a post-filing period price uptick for bankruptcies filed from 2000 to 2003.

We also conducted tests of differences in returns across the 1993-1999 period versus the 2000-2003 period. The asterisks in Panel A of Table 1 denote significant differences between the two periods. There are no significant differences in the pre-filing or filing period returns across the two periods. However, the day +2 to +5 period (and the day +6 to +10 period) returns are significantly higher for bankruptcies filed in the 1993-1999 period than for bankruptcies filed in the 2000-2003 period.

Panel C of Table 1 reports the results for the entire 1993-2003 period taken as a whole. As expected, combining the 1993-1999 period (where the mean post-filing runup occurs) with the 2000-2003 period (where the post-filing runup does not manifest) renders the day +2 to +5 runup marginally significant for the 1993-2003 period taken as a whole. Combining the 1993-1999 bull market with the 2000-2003 bear market masks the differences between the two periods. Hence, in addition to reporting results for the 1993-2003 period as a whole, we also report the results of our remaining tests separately for each of the two subperiods.

The simple cross-sectional averages reported in Table 1 are purely descriptive. Subsequent analyses provide much more powerful evidence of return reversals by *directly linking* the signed magnitude of a firm's filing period return with the signed magnitude of its post-filing period returns.

---

[14] As will be shown in Tables 3 and 4, post-filing returns in the 2000-2003 period are generally not significantly associated with filing period returns after controlling for other factors associated with post-filing returns.

B. **Explaining the Magnitude of Post-Bankruptcy Filing Returns**

If investors initially perceived the price plunge at the bankruptcy filing date as too extreme, then the [+2, +5] post-filing abnormal returns will be negatively associated with the filing period abnormal returns. (In contrast, if the immediate post-filing period abnormal returns are *not* a systematic reversal of the bankruptcy filing period price changes -- for example if the day +2 to +5 returns are related to new information arriving from day +2 to +5 -- then the magnitude of the day +2 to +5 post-filing returns will be independent of the filing period price plunge.) Further, if the abnormal returns in the [+2,+5] period are themselves a temporary reversal, then the magnitude of the returns in the [+6, +10] period will be negatively associated with the abnormal returns in the [+2,+5] period. We now turn to more powerful tests of price reversals by linking the magnitude and direction of each firm's filing period abnormal returns (over days −1 to +1), with the same firm's immediate post-filing period (days +2 to +5) and subsequent post-filing period (days +6 to +10) abnormal returns.

We estimate Model 1 below, which regresses the day [+2,+5] immediate post-filing period abnormal returns on the bankruptcy petition filing period abnormal return over days [-1,+1], to ascertain whether firms' day +2 to +5 abnormal returns are inversely related to their own day −1 to day +1 abnormal returns. Next, Model 2 tests whether firms' subsequent day +6 to +10 abnormal returns are inversely associated with their preceding day +2 to +5 abnormal returns (after controlling for the bankruptcy filing period abnormal returns from day -1 to +1).[15] Both models control for four other factors that may be associated with firms' post-filing returns: (1) firm size, (2) firm financial condition before bankruptcy, (3) debtor-in-possession financing,

---

[15] Models 1 and 2 form a recursive system of equations. Recursive models can be consistently estimated via equation-by-equation estimation of the individual component equations (Greene 2000, p. 660).

and (4) whether or not the firm arranged a "prepackaged" bankruptcy filing, where the firm and

its creditors negotiate the reorganization plan before the bankruptcy filing:

$$Model\ 1:\ AR[+2,+5]\ =\ \alpha_0 + \alpha_1 AR[-1,+1] + \alpha_2 LTASSET + \alpha_3 ZSCORE +$$

$$\alpha_4 DIP + \alpha_5 PREPACK + \varepsilon$$

$$Model\ 2:\ AR[+6,+10] = \beta_0 + \beta_1 AR[+2,+5] + \beta_2 AR[-1,+1] + \beta_3 LTASSET +$$

$$\beta_4 ZSCORE + \beta_5 DIP + \beta_6 PREPACK + \tau$$

where:

AR[+2,+5]	$\equiv$	Abnormal returns over days [+2,+5] after the bankruptcy petition filing date,
AR[+6,+10]	$\equiv$	Abnormal returns over days [+6,+10] after the bankruptcy petition filing date,
AR[-1,+1]	$\equiv$	Abnormal returns over the day [-1,+1] event window centered on the bankruptcy petition filing date,
LTASSET	$\equiv$	firm size, measured as the natural log of total assets as of the fiscal year-end preceding bankruptcy,
ZSCORE	$\equiv$	firm financial condition, measured as of the fiscal year-end preceding bankruptcy, using Altman's (1968) Z-score,
DIP	$\equiv$	indicator variable equal to 1 if the firm received debtor-in-possession financing by post-filing day +5, and 0 otherwise,
PREPACK	$\equiv$	indicator variable equal to 1 if the firm filed a prepackaged bankruptcy petition, and 0 otherwise.

As explained above, if the day +2 to +5 runup is a partial reversal of the bankruptcy

filing period price plunge, then the magnitude of AR[+2,+5] will be inversely related to AR[-1,+1], and the AR[-1,+1] coefficient in Model 1 (α_1) will be negative. If the day [+2,+5]

abnormal returns are themselves a temporary runup, then prices will subsequently drop back

down. In this case, the magnitude of the day [+6,+10] returns will be inversely related to AR[+2,+5], and the AR[+2,+5] coefficient in Model 2 (β_1) will be negative.

Because of the controversy in prior research on whether firm size partially accounts for observed overreactions (e.g., Zarowin 1990), we control for size to ensure that it does not confound our analysis. Our proxy for firm size is the natural log of total assets (LTASSET) measured as of the fiscal year-end preceding bankruptcy.[16]

Post-filing recovery could depend on firms' financial condition before bankruptcy. We control for each firm's financial condition using Altman's (1968) Z-score (ZSCORE) as of the fiscal year-end preceding bankruptcy. Following Altman (1968), we compute ZSCORE as follows:[17]

$$Z = 0.012X_1 + 0.014X_2 + 0.033X_3 + 0.006X_4 + 0.999X_5$$

Where:

X_1	=	Working capital/Total assets
X_2	=	Retained earnings/Total assets
X_3	=	Earnings before interest and taxes/Total assets
X_4	=	Market value of equity/Total Debt (book value)
X_5	=	Sales/Total assets

---

[16] Our inferences are unaffected if we use two alternative measures of firm size – net sales or market value of common equity. Additionally, including a control variable that indicates whether the firm trades on the NYSE or AMEX does not affect any of the study's inferences. Finally, to ensure that the "January effect" does not confound our results (e.g., Zarowin 1990; Loughran and Ritter 1997), we repeat our analyses after eliminating 24 firms that filed for bankruptcy in the month of January. The study's inferences are unchanged.

[17] Altman's bankruptcy prediction model coefficients are based on annual financial statement data, so we apply his coefficients to data from the annual financial statement immediately preceding the bankruptcy filing. Our inferences are unaffected if we use Zmijewski's (1984) financial condition index (FCI) to measure each firm's financial condition. We calculate FCI by estimating the PROBIT model from Panel A of Zmijewski's (1984, p. 69) Table 3: FCI = –4.336–4.513(Return on Assets)+5.679(Financial Leverage)+0.004(Liquidity). Return on Assets is computed as net income to total assets, Financial Leverage as total debt to total assets, and Liquidity as current assets to current liabilities. Instead of using a composite index for financial condition like Altman's Z-score or Zmijewski's FCI, we also include return on assets, leverage, and liquidity as separate explanatory variables in the model. The inferences for the return variables of interest are identical, and return on assets, leverage, and liquidity are not individually significant (i.e., the composite financial condition indexes explain more of the post-filing returns).

Many firms that file for bankruptcy seek debtor-in-possession (DIP) financing to fund operations while they attempt to reorganize. Dahiya, John, Puri, and Ramirez (2003) find that firms receiving DIP financing spend less time reorganizing under Chapter 11, and are more likely to successfully emerge from bankruptcy. Thus, we control for DIP financing by coding DIP as 1 if the firm received DIP financing by post-filing day +10, and 0 otherwise.

Finally, some firms negotiate their reorganization plans with creditors before filing for bankruptcy. Firms that file these "prepackaged" bankruptcies ("prepacks") spend less time in financial distress than do firms with traditional Chapter 11 filings, and the terms of the prepack often reduce disruption to the firm's normal business operations (Betker 1995; Tashjian, Lease, and McConnell 1996). Chatterjee, Dhillon, and Ramirez (1996) also show that firms filing prepackaged bankruptcies are on average "higher quality" (where "quality" is defined as operating cash flows divided by sales or assets obtained from the annual financial statements for the year before the filing) than firms with traditional Chapter 11 filings. Tashjian, Lease, and McConnell (1996) show that prepacks' creditors enjoy higher average recovery rates than do creditors of firms engaging in traditional filings. To ensure that our inferences are not affected by differences in outcome prospects between firms that engage in prepacks versus traditional Chapter 11 filings, we control for these prepackaged bankruptcies (PREPACK), identified from: (1) New Generation Research's *The Bankruptcy Yearbook & Almanac* (1994-2004 editions), (2) LEXIS, and (3) Thomson Research.

1. Univariate Correlations

Before turning to the regression results, Table 2 presents descriptive univariate correlations among the filing period abnormal returns, the post-filing period abnormal returns, and the control variables. Panel A of Table 2 presents results for the entire 1993-2003 period taken as a whole. For parsimony, results reported above the diagonal are based on returns

calculated from closing bid-ask midpoints, and results reported below the diagonal of Table 2 are based on returns calculated from the closing transaction prices. These correlation (and subsequent regression) analyses provide more powerful tests of return reversals than the simple cross-sectional average returns reported in Table 1, by directly linking the signed magnitude of a firm's filing period return with the signed magnitude of its post-filing returns.

Panel A of Table 2 shows that – even for the 1993-2003 sample period taken as a whole – there is a significant reversal in the immediate post-filing period. Specifically, the immediate post-filing return AR[+2,+5] is negatively correlated with the filing period return AR[-1,+1] ($\alpha \leq$ 0.02). This result holds for returns based on bid-ask midpoints (above the diagonal) and closing transaction prices (below the diagonal). Because these results hold for returns based on bid-ask midpoints (and untabulated analyses reveal that inferences are identical using returns based on closing bids, $\alpha \leq 0.005$), the negative correlations (i.e., the reversals) between returns in the filing period and those in the immediate post-filing period are not attributable to bid-ask bounce.

Panel B of Table 2 reports correlations separately for: (1) bankruptcies filed from 1993-1999, shown above the diagonal, and (2) bankruptcies filed from 2000-2003, shown below the diagonal. For parsimony, we focus on the bid-ask midpoint return measure because it minimizes any effect of bid-ask bounce. For bankruptcies filed during the 1993-1999 bull market, the top portion of Panel B reveals a highly significant reversal between the AR [-1, +1] filing period returns and the AR [+2, +5] immediate post-filing period returns ($\alpha \leq 0.0001$). In contrast, in the more sober 2000-2003 period shown below the diagonal, the correlation between the filing and immediate post-filing period returns is insignificantly *positive*.[18] Clearly, the negative correlation

---

[18] Results based on closing bids and closing transaction prices yield identical inferences: There is a significant reversal between AR [-1, +1] and AR [+2, +5] in the 1993-1999 period ($\alpha \leq 0.0001$) but no evidence of a reversal in the 2000-2003 period.

between the AR[-1,+1] filing period and the immediate post-filing period return AR[+2, +5] reported in Panel A is entirely attributable to bankruptcies filed during the 1993-1999 bull market.

We also find evidence of a second reversal between the two post-filing periods, AR[+2, +5] and AR[+6, +10]. Panel A shows that for the 1993-2003 period as a whole, the correlation between AR[+2, +5] and AR[+6, +10] is significantly negative ($\alpha \leq 0.05$), indicating a reversal of the immediate post-filing period runup. Turning to Panel B of Table 2, results reported above the diagonal show that during the 1993-1999 bull market, AR[+6, +10] (based on bid-ask midpoints) is negatively correlated with AR[+2, +5] ($\alpha \leq 0.05$), and untabulated results show that this correlation is also negative ($\alpha \leq 0.10$) in the 1993-1999 period when returns are based on closing prices. Thus, for bankruptcies filed during the 1993-1999 bull market, we observe reversals (over days +6, +10) of the anomalous price runup in the immediate post-filing period (days +2, +5). For bankruptcies filed in the 2000-2003 period, results below the diagonal in Panel B also show a negative correlation between AR[+2, +5] and AR[+6, +10] when returns are based on bid-ask midpoints ($\alpha \leq 0.03$). However, the regression analysis in Table 4 will show that this negative relation becomes insignificant after controlling for firm size, financial condition, debtor-in- possession financing, and prepackaged bankruptcies.

Panel A of Table 2 also reveals some interesting relations between the filing period and post-filing period returns and the control variables. Panel A shows that larger firms and firms filing prepackaged bankruptcies experience less precipitous price plunges in the filing period ($\alpha \leq 0.004$). Turning to the immediate post-filing period AR[+2, +5], we find that larger firms enjoy higher post-filing returns ($\alpha \leq 0.008$), consistent with the supplementary (untabulated) evidence reported in Section IIIA that firms experiencing the apparently anomalous positive abnormal returns in the immediate post-filing window are larger and more heavily traded than

firms that do not experience a reversal in the immediate post-filing period. The subsequent post-filing period returns AR[+6, +10] are positively correlated with ZSCORE ($\alpha \leq 0.0001$), suggesting that firms in better financial condition before bankruptcy enjoy more favorable returns in the +6 to +10 period. LTASSET is also significantly positively correlated with DIP ($\alpha \leq 0.0001$) and PREPACK ($\alpha \leq 0.01$), so larger firms are more likely to arrange debtor-in-possession financing, and to file prepackaged bankruptcies.

To summarize, Table 2 shows that part of the bankruptcy filing period price plunge reverses over days +2, +5. However, this reversal is confined to bankruptcies filed during the 1993-1999 bull market; no such reversal occurs after bankruptcies filed in the more sober 2000-2003 period. Evidence further suggests that part of this immediate post-filing runup in the 1993-1999 period was temporary, as we find a second reversal where AR[+2, +5] is negatively correlated with AR[+6, +10]. However, the results reported in Table 2 are simply descriptive. The significant correlations between the abnormal return measures and firm size, prepackaged bankruptcies, and firm financial condition, indicate the importance of controlling for these latter factors to avoid a correlated omitted variable problem when testing the relations between filing and post-filing period returns. Consequently, the regression analyses that control for these variables yield the most reliable inferences.

Insert Table 2 about here
----

2.   Regressions Explaining the Day +2 to +5 Abnormal Returns

We now investigate whether the negative association between the filing period abnormal returns cumulated from day -1 to +1, and the abnormal returns cumulated over the day +2 to +5 immediate post-filing period, is robust to controlling for the other factors associated with post-filing returns. Table 3 presents the results of estimating Model 1, using abnormal returns based on closing transaction prices, closing bids, and the closing bid/ask midpoints. Panel A reports results for the entire 1993-2003 period taken as a whole. Panels B and C report results for the 1993-1999 and 2000-2003 periods, respectively. Panel D reports tests of the statistical significance of the differences in the coefficients across the two time periods.

Panel A shows that for bankruptcies filed throughout the 1993-2003 period as a whole, for all three abnormal return measures, the AR[-1,+1] coefficient, α_1, is negative ($\alpha \leq 0.04$) even after controlling for firm size, firm financial condition, DIP financing, and prepackaged bankruptcy filings.[19]   Interestingly, firm size is *positively* associated with AR[+2, +5] ($\alpha \leq$ 0.004), indicating that the anomalous post-filing runup is more pronounced for larger firms. This is consistent with the supplementary (untabulated) evidence we previously mentioned in Section III A: firms experiencing the apparently anomalous runup in the immediate post-filing period are on average larger and more heavily traded than those not experiencing a post-filing runup.

Panels B, C, and D of Table 3 show that, consistent with the inferences from the univariate analyses in Tables 1 and 2, this reversal in the immediate post-filing period is attributable to bankruptcies filed during the 1993-1999 bull market. Panel B provides strong evidence that for bankruptcies filed from 1993-1999, the steeper the day −1 to +1 decline, the

---

[19] Analyses of the studentized regression residuals using the Belsley, Kuh, and Welch (1980) procedure led to the identification of at most two outliers in each regression model. We report results after deleting any outliers. However, our inference that the day +2 to +5 abnormal return is negatively associated with the day -1 to +1 abnormal return holds even if we do not delete extreme values ($\alpha \leq 0.01$). Our inferences also hold if we estimate the model on just those firms with positive AR[+2,+5], $\alpha \leq 0.01$.

greater the day +2 to +5 returns ($\alpha \leq 0.0001$). In contrast, Panel C shows no evidence of systematic reversals for bankruptcies filed in the more sober 2000-2003 period (in fact, the coefficients on AR[-1, +1] are insignificantly positive).[20] We next compare the parameter estimates obtained from estimating the regression model based on the bankruptcies filed from 1993 to 1999 (as reported in Panel B) against those obtained from estimating the model based on bankruptcies filed from 2000-2003 (as reported in Panel C), to assess the statistical significance of the differences across the two time periods. Panel D reports the differences in the estimated regression coefficients across the two time periods, along with corresponding t-statistics for tests of the statistical significance of the differences between the two sets of coefficients.[21] Panel D confirms that the coefficient on AR[-1, +1] is significantly more negative in the 1993-1999 period than in the 2000-2003 period ($\alpha \leq 0.001$). Thus, Table 3 shows that we observe a reversal over days +2 to +5 for bankruptcies filed in the 1993-1999 period but not for bankruptcies filed in the 2000-2003 period, and this difference between the two periods is statistically significant.

---

[20] The inferences we draw based on the regressions reported in Tables 3 and 4 are not attributable to collinearity, because none of the variance inflation factors exceed 1.8 in any of the models reported in Tables 3 and 4 (Greene 2000, p. 258, Belsley, Kuh, and Welsch 1980, p. 153].

[21] An alternative method of assessing the significance of the difference across the two time periods would be to estimate a single model that interacts a time-period indicator variable with all of the explanatory variables. Unfortunately, this model's results are uninterpretable due to severe collinearity, as evidenced by VIFs in excess of 14. As a second alternative, we also estimated a reduced model that interacts the time period indicator variable with only the return variable:

AR[+2,+5] = δ_0 + δ_1AR[-1,+1] + δ_2 D93-99 × AR[-1,+1] + δ_3TASSET + δ_4ZSCORE + δ_5DIP + δ_6PREPACK + ε, where D93-99 is an indicator variable that equals 1 for bankruptcies filed from 1993-1999, and 0 otherwise. This reduced model yields similar inferences to those drawn based on Panel D of Table 3. Specifically, δ_2, the coefficient that represents the *difference* between the relation for the 1993-1999 period and the 2000-2003 period, is significantly negative ($\alpha \leq 0.0001$), and the sum of δ_1 *plus* δ_2, which represents the total relation between AR [+2,+5] and AR [-1,+1] for bankruptcies filed during 1993-1999, is also significantly negative ($\alpha \leq 0.0001$). Finally, δ_1, the coefficient that represents the relation between AR [+2, +5] and AR [-1, +1] for bankruptcies filed in the 2000-2003 period is insignificant. Collectively, these results confirm those based on the primary statistical tests reported in Table 3: an immediate post-filing reversal occurs only in the 1993-1999 period, and not in the 2000-2003 period, and the difference between the two periods is statistically significant. An important disadvantage of this reduced model approach is that it constrains the coefficients on all of the control variables to be identical across the two periods. Because the data suggest that the coefficients on the control variables differ significantly across the two periods (particularly ZSCORE), the tests reported in Panel D of Table 3 are more appropriate.

With respect to the control variables in Model 1, the coefficient on LTASSET is positive, ($\alpha \leq 0.03$), indicating that larger firms enjoy more favorable returns over the day +2 to +5 period. Finally, for bankruptcies filed during the 2000-2003 period, the positive coefficient on ZSCORE suggests that firms in better financial condition before bankruptcy enjoy more favorable returns over the day +2 to +5 window (when returns are measured based on closing bids or bid-ask midpoints).

Insert Table 3 about here
----

3. Regressions Explaining the Day +6 to +10 Abnormal Returns

To ascertain whether the price reversal occurring just after the bankruptcy filing date is itself partially reversed, Model 2 regresses the subsequent post-filing AR [+6,+10], on the immediate post-filing AR[+2,+5], after controlling for AR[-1,+1] and the other control variables. Panel A of Table 4 shows that, for bankruptcies filed over the 1993-2003 period as a whole, the AR[+2,+5] coefficient, β_1, is significantly negative ($\alpha \leq 0.03$), even after controlling for firm size, firm financial condition, DIP financing, and prepackaged bankruptcy filings.

Panels B and C of Table 4 provide evidence suggesting that this second reversal is largely confined to bankruptcies filed during the 1993-1999 period. Panel B shows that for bankruptcies filed from 1993-1999, the coefficient on AR[+2, +5] is significantly negative ($\alpha \leq 0.03$), suggesting that the significant price runup in the immediate post-filing period is short-lived as prices decline again in the day +6 to +10 period. Finding that this second reversal also holds for abnormal returns based on closing bids and the closing bid/ask midpoints (as well as closing transaction prices), indicates that the systematic patterns of post-filing returns during the 1993-1999 period are not attributable to bid-ask bounce. Interestingly, the coefficient on AR [-1, +1] is also significantly negative ($\alpha \leq 0.03$) for two of the three return measures (the closing

20

transaction prices and closing bids). This provides additional evidence that, for bankruptcies filed in the 1993-1999 period, post-filing returns are inversely associated with the magnitude of the bankruptcy filing period price plunge. In contrast, Panel C shows no systematic evidence of reversals for bankruptcies filed in the 2000-2003 period. Of the six regression coefficients on the AR[+2, +5] and AR[-1, +1] variables, five are insignificant, and only the coefficient on the closing bid AR [+2, +5] is significantly negative ($\alpha \leq 0.05$). While Table 4 shows evidence of significant reversals in the day +6 to +10 returns for bankruptcies filed in the 1993-1999 period but not for those filed from 2000-2003, Panel D shows that the estimated regression coefficients on the return variables are not significantly more negative in the 1993-1999 period (except that the AR [-1, +1] coefficient is significantly more negative in the 1993-1999 period when returns are measured using closing transaction prices).

With respect to the control variables, the positive coefficient on ZSCORE in the 1993-1999 time period indicates that firms in stronger financial condition before bankruptcy enjoy more favorable day +6 to +10 post-filing period returns ($\alpha \leq 0.0001$).

In sum, Table 4 shows that for bankruptcies filed in the 1993-1999 period, the day +6 to +10 abnormal returns are negatively correlated with (i.e., partially reverse) the filing period and immediate post-filing period returns. There is no systematic evidence of similar reversals after bankruptcies filed in the 2000-2003 period.

Insert Table 4 about here
----

4.   Summary of Post-Filing Abnormal Return Results

To summarize our results so far, the simple cross-sectional average returns reported in Table 1 document a steep price decline when firms file for bankruptcy, followed by an immediate post-bankruptcy filing period price runup from days +2 to +5 that is significant at the mean. This apparently anomalous runup in the immediate post-filing period is concentrated among larger firms. More powerful tests link the magnitude and direction of the filing period and post-filing period abnormal returns for each firm, and control for other factors that could be associated with post-filing abnormal returns (Tables 2, 3 and 4). Collectively, these analyses reveal systematic patterns of returns after bankruptcies. The immediate post-filing period abnormal return from days +2 to +5 is negatively associated with the day -1 to +1 filing period abnormal return. Moreover, the day +2 to +5 abnormal returns are also negatively associated with the subsequent day +6 to +10 returns. These two reversals are not simply an artifact of bid-ask bounce, because they hold when we compute returns based on closing bid prices or closing bid-ask averages. This pattern is consistent with temporary over-optimism shortly after the bankruptcy filing. Further analysis reveals that these two reversals are confined to bankruptcies filed during the bull market from 1993-1999. In contrast, we find no systematic evidence of reversals after bankruptcies filed during the more sober 2000-2003 period. The differences we observe across the 1993-1999 versus 2000-2003 time periods add to the growing empirical evidence that investors' reactions to certain information events appear to be more anomalously optimistic when those events occur in bull markets (e.g., Loughran and Ritter 2002, 2004; Demers and Lev 2001; Bryant, Henning, and Shaw 2003).

In sum, the systematic patterns of post-filing returns are inconsistent with an efficient market impounding the bankruptcy filing information in a quick and unbiased manner. Efficient assimilation of the information would of course suggest that abnormal returns in the [-1,+1], [+2,+5], and [+6,+10] periods would be mutually independent. Given that Bessembinder and Kaufman

(1997a, 1997b) find evidence that small trades often move prices, our results raise the question whether the systematic post-filing price fluctuations could be attributable to the trades of smaller and less informationally sophisticated investors. To address this question, we next analyze investors' trading around and after bankruptcy filings.

IV.   Investor Trades Around Bankruptcy Filings

We now consider whether the price reversals after bankruptcy filings are likely attributable to a flurry of trades by relatively unsophisticated investors. We use trade size to distinguish sophisticated, better-informed investors from less sophisticated, less informed investors, following Easley and O'Hara (1987), Chan and Lakonishok (1993), Bhattacharya (2001), and Bushee, Matsumoto, and Miller (2003), among others.

Lee and Radhakrishna (2000) show that researchers can increase the power of statistical tests designed to separate the trading activities of better-informed, sophisticated traders from less-informed and less sophisticated traders by focusing on large and small trades, respectively, and eliminating medium-sized trades. Kyle's (1985) model predicts that although informed investors typically make relatively large trades, they may make medium-sized trades to avoid revealing their private information. Empirical evidence is consistent with this prediction (e.g., Cornell and Sirri 1992, Chakravarty 2001).[22] Consequently, we use a two-cutoff approach, focusing on small versus large trades, and eliminating medium-sized trades.

We classify transactions of 500 shares or less as small trades, and transactions of 3,000 shares or more as large trades. Untabulated analyses yield similar inferences using alternative

---

[22]   Informed traders are unlikely to engage in very small trades, however. Breaking a large order into small parts increases direct transaction costs, and a flurry of small orders from one account would likely prompt the specialist to increase the spread. Also, the arbitrage window for exploiting private information is often short. Breaking an order into small parts would require time to move all the shares, thereby increasing the chance that prices would adjust to impound the investor's private information before completion of all the transactions, which would in turn erode trading profits.

cutoffs of 300 shares, 700 shares, and 900 shares to identify small traders, and 2,500 shares, 3,500 shares, and 4,000 shares to identify large traders. Finally, to assess the robustness of our results to a single cutoff approach, we repeat the analysis after including the medium-sized trades, by classifying transactions of less than 1,000 shares as small trades, and transactions of 1,000 shares or more as large trades.

To capture small traders' abnormal trading response (SMATRD), we compute for the [-1, +1] event window the number of transactions (i.e., the number of trades) classified as small trades in the [-1,+1] event window, and divide this number by a non-announcement period benchmark, to express the event period number of transactions as a percentage of the typical non-announcement period number of transactions. The non-announcement period spans the month that starts six months before the bankruptcy filing date. For the day -1 to +1 event window, the non-announcement period consists of seven consecutive non-overlapping three-day windows (i.e., 21 trading days spanning approximately a month). We count the number of small trades in each of these seven three-day non-announcement periods, and we use the median of these seven numbers as the non-announcement period benchmark number of small trades.[23]

SMATRD for the [+2,+5] window is computed similarly, except the non-announcement period consists of five four-day long consecutive and non-overlapping windows (i.e., 20 trading days) spanning the same month as the non-announcement period for the day [−1,+1] window. We compute SMATRD for the [+6,+10] window the same way, except the non-announcement period consists of four five-day long consecutive and non-overlapping windows (i.e., 20 trading

---

[23] Measuring the benchmark non-announcement period trading in this manner takes into account serial correlation in the daily number of trades.

days).[24] Likewise, we calculate large traders' abnormal trading response based on the number of transactions (LGATRD).

Table 5 reports small and large traders' abnormal trading responses to bankruptcies over the [-1,+1], [+2,+5], and [+6,+10] windows in Panels A, B, and C, respectively.[25] Given the well-documented skewness of trading response metrics (e.g., Bamber 1987, Bhattacharya 2001), we report cross-sectional medians as well as means, and the results of nonparametric statistical tests, as well as parametric tests. Panel A of Table 5 shows that in the [-1,+1] bankruptcy filing event window, LGATRD exceeds SMATRD ($\alpha \leq 0.01$) for both the cutoffs used to classify trades as small or large. This result holds in all periods (except that the median difference is significant only at the 10% level in the 2000-2003 period when we use 1,000 shares traded as the cutoff between small versus large trades). Overall, large traders' abnormal trading response far exceeds small traders' abnormal trading response. For example, over the entire 1993-2003 period, using 500 shares or less as the cutoff for small traders, Panel A of Table 5 shows that the median number of small traders' transactions in the [-1,+1] event window is only about a third higher than their median number of transactions in the non-announcement period. In contrast, the median number of large traders' transactions (using 3,000 shares or more as the cutoff for large traders) in the [-1,+1] event window is more than four times their median number of transactions in the non-announcement period. Thus, the price plunge in the [-1,+1] bankruptcy filing event window is primarily attributable to large traders' activities.

---

[24] Analogous measures based on the total number of shares traded by small and large traders yield identical inferences.

[25] The results reported in Table 5 include all sample firms for which TAQ reports data on the number of trades. Our evidence reveals that TAQ has more limited coverage than CRSP. In particular, TAQ is much more aggressive than CRSP in dropping coverage of a firm after it files for bankruptcy, even if the firm continues to trade on the NYSE, AMEX, or Nasdaq. Unfortunately, we cannot identify the number of trades for sample firms not covered by TAQ.

Panel B of Table 5 shows that large traders' abnormal trading activity remains significantly greater than small traders' abnormal trading activity in the [+2,+5] immediate post-filing period. For example, over the entire 1993-2003 period, at the median small traders make *fewer* trades in the immediate post-filing period than in the non-announcement period. In contrast, the median number of large traders' (3,000 shares or more) transactions in the [+2,+5] post-filing event window is more than twice as large as their median transactions in the non-announcement period. The abnormal number of large trades exceeds the abnormal number of small trades (i.e., LGATRD values exceed SMATRD values) for all cases in Panel B.

Panel C shows the results of analyzing investor trades in the [+6,+10] post-filing period. The results for the 1993-2003 period as a whole, and the 1993-1999 period are consistent with those for the day −1 to +1, and day +2 to +5 windows. Over the day +6 to +10 window, large traders' abnormal number of trades significantly exceeds small traders' abnormal number of trades (i.e., LGATRD exceeds SMATRD). However, there is little indication of significant differences between the numbers of small versus large traders in the day +6 to +10 window for bankruptcies filed in the 2000-2003 period. The results for the day +6 to +10 period should be interpreted with caution, however, because TAQ is much more aggressive than CRSP in dropping firms after they file for bankruptcy, even if the firms continue to trade on the NYSE, AMEX, and Nasdaq. Therefore, the results from the day +6 to +10 window are based on the subset of firms for which TAQ continues to report number of trades.

Why would large investors trade bankrupt firms' shares? Lakonishok, Shleifer, Thaler, and Vishny (1991) find that pension funds trade poorly performing shares more often than they trade other stocks. The authors suggest that many institutions prefer not to have to defend the

presence of extreme losers (like firms that have filed for bankruptcy) in their portfolios. In contrast, other institutions with different investment goals may buy the losers after the price has declined because they can justify buying losers after the price has fallen.[26]

In summary, large traders' abnormal trading activity significantly exceeds small traders' abnormal activity during and after bankruptcies. Thus, the post-filing price fluctuations for bankruptcies filed in the 1993-1999 bull market are unlikely attributable to naïve trading by small investors. These systematic patterns of post-filing returns appear to be fueled primarily by large traders. This result echoes Demers and Joos' (2004) conclusion that trading in the biotech and Internet sectors was also concentrated among large investors during the market bubble period. Collectively, these studies' evidence supports Fung, Mok, and Lam's (2000, p. 1200) conjecture that even sophisticated investors are not immune from overreaction.

V.   Conclusion

Consistent with prior research, we find that share prices plunge before and at the date of Chapter 11 bankruptcy filings. In a fairly recent development, many firms continue trading on national exchanges (NYSE, AMEX, and Nasdaq) after filing for bankruptcy. We provide new evidence on the pattern of returns and investor trading after the bankruptcy filing date.

We find a systematic pattern of post-filing returns -- the filing period price plunge is followed by a price runup in the immediate post-filing period that turns out to be short-lived. Thus, we find evidence of two post-filing reversals: (1) the price plunge from day -1 to +1 is inversely associated with abnormal returns over the immediate post-filing period from day +2 to +5, and (2) abnormal returns over days +2 to +5 are inversely associated with abnormal returns cumulated over the subsequent post-filing period, day +6 to +10. These reversals are not attributable to bid-ask

---

[26] We thank the reviewer for suggesting this explanation for our results. Unfortunately, we cannot directly test this conjecture, because TAQ data do not indicate *who* is buying and *who* is selling. We leave this as an interesting issue for future research.

bounce. Furthermore, in contrast to most previously documented anomalies, supplementary analysis reveals that the anomalous day +2 to day +5 post-filing runup is concentrated among larger and more heavily-traded firms.

Detailed analysis of individual investor trades suggests that these price reversals cannot be attributed to small, arguably less sophisticated traders. To the contrary, we find that large traders are more active than small traders around and after bankruptcy filings.

Further analysis reveals that these post-filing price fluctuations arise in response to bankruptcies filed during the 1993-1999 bull market, but not to bankruptcies filed during the more sober 2000-2003 period. This difference across the two time periods adds to a small but growing literature documenting that investors' reactions to certain information events appear to be more anomalously optimistic when those events occur in bull markets than when they occur in bear markets. For example, Loughran and Ritter (2002; 2004) document greater post-IPO runups and larger first day returns after IPOs during bull markets, Demers and Lev (2001) show that the market (positively) values Internet firms' aggressive cash expenditures and marketing expenditures during the bubble period, but not after the bubble period, and Bryant, Henning, and Shaw (2003) show that pro forma earnings numbers are value relevant in the 1990s, but not in 2000 and later. This body of evidence is consistent with the prediction from Gervais and Odean's (2001) model that during bull markets, investors are overconfident in (and thus overweight) unreasonably positive prior beliefs about the firm's prospects, whereas they

underweight more objective negative information (bankruptcy filing information in our case), thereby at least temporarily overvaluing the firm.[27]

In contrast, the 2000-2003 period was characterized by a declining market. The absence of systematic post-filing reversals after bankruptcies filed from 2000-2003 suggests investors more carefully assimilate bankruptcy filing information in the sober 2000-2003 period. This result is consistent with Gervais and Odean's (2001) theoretical prediction that major market losses reduce investor overconfidence. In our setting, this suggests that investors are less likely to overweight their own prior beliefs while underweighting the bad news in the bankruptcy filings.

---

[27] Theory (e.g., Kyle and Wang 1997, Odean 1998, Daniel, Hirshleifer, and Subrahmanyam 1998, Gervais and Odean 2001, Slezak 2003) and experimental markets research (e.g., Nelson, Bloomfield, Hales, and Libby 2001) conclude that information processing biases common to a significant set of investors can affect market prices, at least temporarily. In Gervais and Odean's (2001) model, investors overreact to beliefs or information in which they are overconfident. If investors' bias is below a certain threshold, then the overreaction is eventually corrected. This implication of their model is consistent with the pattern of post-filing returns we observe for bankruptcies filed from 1993 to 1999: overconfident investors overreact to excessively optimistic priors, bidding up prices from days +2 to +5, and this overreaction is eventually corrected as prices fall after day +6.

TABLE 1

Cumulative Abnormal Returns Around Bankruptcy Petition Filing Dates
(p-values in parentheses)

Period	N	CARs Based on Closing Transaction Price	N	CARs Based on Closing Bid	N	CARs Based on Closing Bid/Ask Midpoint
Panel A: 1993-1999						
[-10,-6]	193	-8.11 (0.0001)	193	-9.49 (0.0001)	193	-8.49 (0.0001)
	[29.5]	-5.62 (0.0001)	[21.8]	-6.07 (0.0001)	[23.8]	-5.48 (0.0001)
[-5,-2]	193	-9.01 (0.0001)	193	-5.75 (0.0120)	193	-8.37 (0.0001)
	[28.0]	-6.06 (0.0001)	[28.5]	-1.76 (0.0001)	[26.9]	-3.73 (0.0001)
[-1,+1]	194	-26.19 (0.0001)	193	-27.90 (0.0001)	193	-26.02 (0.0001)
	[19.6]	-26.36 (0.0001)	[18.7]	-27.49 (0.0001)	[18.1]	-24.46 (0.0001)
[+2,+5]	194	8.22 (0.0177) *	189	9.09 (0.0155) **	189	5.33 (0.0776) *
	[47.4]	-0.44 (0.5183) *	[43.9]	-0.44 (0.1093) ***	[41.3]	-0.70 (0.0197) ***
[+6,+10]	189	-2.13 (0.3842) ***	186	2.42 (0.4920) **	186	1.49 (0.5677) ***
	[37.0]	-2.79 (0.0004) *	[36.0]	-1.39 (0.0002)	[38.2]	-1.81 (0.0015) **
Panel B: 2000-2003						
[-10,-6]	77	-9.76 (0.0388)	76	-8.63 (0.1012)	76	-7.31 (0.1533)
	[23.4]	-10.55 (0.0001)	[22.4]	-9.75 (0.0001)	[25.0]	-8.67 (0.0001)
[-5,-2]	77	-7.42 (0.0277)	74	-7.67 (0.0245)	74	-7.14 (0.0333)
	[31.2]	-5.42 (0.0013)	[32.4]	-4.98 (0.0034)	[32.4]	-5.25 (0.0034)
[-1,+1]	78	-23.98 (0.0001)	77	-23.65 (0.0001)	77	-25.37 (0.0001)
	[25.6]	-26.17 (0.0001)	[27.3]	-23.35 (0.0001)	[27.3]	-28.30 (0.0001)
[+2,+5]	77	-2.10 (0.6421)	75	-5.03 (0.2791)	75	-4.29 (0.3138)
	[35.1]	-5.56 (0.0117)	[32.0]	-6.87 (0.0024)	[33.3]	-7.06 (0.0052)
[+6,+10]	73	-10.32 (0.0001)	69	-6.44 (0.0165)	69	-8.80 (0.0002)
	[27.4]	-8.35 (0.0001)	[39.1]	-4.89 (0.0912)	[30.4]	-8.59 (0.0016)

*, **, and *** denote that the CARs are significantly different across the 1993-1999 versus 2000-2003 period at the 10%, 5%, and 1% levels, respectively.

TABLE 1 (continued)

Panel C: 1993-2003

[-10,-6]	270	-8.58 (0.0001)	269	-9.25 (0.0001)	269	-8.16 (0.0001)	
	[27.8]	-7.11 (0.0001)	[21.9]	-6.73 (0.0001)	[24.2]	-5.94 (0.0001)	
[-5,-2]	270	-8.56 (0.0001)	267	-6.28 (0.0010)	267	-8.03 (0.0001)	
	[28.9]	-5.91 (0.0001)	[29.6]	-2.44 (0.0001)	[28.5]	-4.32 (0.0001)	
[-1,+1]	272	-25.56 (0.0001)	270	-26.69 (0.0001)	270	-25.84 (0.0001)	
	[21.3]	-26.36 (0.0001)	[21.1]	-26.80 (0.0001)	[20.7]	-25.02 (0.0001)	
[+2,+5]	271	5.29 (0.0584)	264	5.08 (0.0907)	264	2.60 (0.2947)	
	[43.9]	-0.95 (0.0517)	[40.5]	-0.99 (0.0025)	[39.0]	-1.61 (0.0004)	
[+6,+10]	262	-4.41 (0.0195)	255	0.02 (0.9931)	255	-1.30 (0.5182)	
	[34.4]	-4.61 (0.0001)	[36.9]	-1.40 (0.0001)	[36.1]	-3.82 (0.0001)	

The sample includes firms that filed for Chapter 11 bankruptcy between 1993 and 2003. Day 0 is the bankruptcy petition filing date. We calculate the mean and median market-adjusted CARs based on closing transaction prices in column 1, closing bid prices in column 2, and the closing bid/ask midpoint in column 3. The market-adjusted CAR for a given firm is calculated as the percentage difference between the closing stock price, bid, or bid/ask midpoint on the day preceding the first day of the event window and the closing stock price, bid, or bid/ask midpoint on the final day of the event window, less the CRSP equally-weighted return for the event window. For firms with no recorded trade on the day preceding the first day of the event window or the last day of the event window, the CAR is calculated using the first and last recorded trade during the event window. Means are reported first for each period, followed by medians for each period. Two-tailed significance levels from t-statistics (Wilcoxon tests) appear in parentheses beside the corresponding mean (median) CARs. The percent of market-adjusted CARs greater than 0.00 is reported in brackets.

TABLE 2

Correlations Among Bankruptcy Filing Period Abnormal Returns, Post-Filing Abnormal Returns, Firm Size, Firm Financial Condition, Debtor-in-Possession Financing, and Prepackaged Bankruptcy
[p-values in brackets]

Panel A: 1993-2003 Bid/Ask Midpoint Correlations Appear Above the Diagonal
1993-2003 Closing Price Correlations Appear Below the Diagonal

	AR[-1,+1]	AR[+2,+5]	AR[+6,+10]	LTASSET	ZSCORE	DIP	PREPACK
AR[-1,+1]		-0.1432 [0.0199]	-0.0269 [0.6694]	0.1852 [0.0025]	-0.0082 [0.8952]	0.0716 [0.2411]	0.2282 [0.0002]
AR[+2,+5]	-0.1498 [0.0137]		-0.1445 [0.0210]	0.2030 [0.0010]	-0.0702 [0.2630]	0.1032 [0.0931]	-0.0840 [0.1720]
AR[+6,+10]	-0.0365 [0.5569]	-0.1207 [0.0511]		-0.1141 [0.0705]	0.2821 [0.0001]	-0.1182 [0.0584]	-0.0217 [0.7292]
LTASSET	0.1832 [0.0028]	0.1639 [0.0075]	-0.0931 [0.1366]		-0.1991 [0.0012]	0.4988 [0.0001]	0.1700 [0.0055]
ZSCORE	-0.0211 [0.7348]	-0.0490 [0.4309]	0.2670 [0.0001]	-0.1991 [0.0012]		-0.0403 [0.5159]	-0.0637 [0.3041]
DIP	0.0743 [0.2229]	0.0640 [0.2941]	-0.0945 [0.1271]	0.4988 [0.0001]	-0.0403 [0.5159]		0.0734 [0.2277]
PREPACK	0.1740 [0.0041]	-0.0358 [0.5573]	-0.0083 [0.8933]	0.1700 [0.0055]	-0.0637 [0.3041]	0.0734 [0.2277]	

TABLE 2 (continued)

Panel B: 1993-1999 Bid/Ask Midpoint Correlations Appear Above the Diagonal
2000-2003 Bid/Ask Midpoint Correlations Appear Below the Diagonal

	AR[-1,+1]	AR[+2,+5]	AR[+6,+10]	LTASSET	ZSCORE	DIP	PREPACK
AR[-1,+1]		-0.3112 [0.0001]	-0.0617 [0.4032]	0.1687 [0.0203]	-0.0227 [0.7570]	0.1008 [0.1629]	0.2858 [0.0001]
AR[+2,+5]	0.1660 [0.1546]		-0.1453 [0.0485]	0.2286 [0.0017]	-0.1226 [0.0096]	0.1218 [0.0942]	-0.0758 [0.2986]
AR[+6,+10]	0.0827 [0.4991]	-0.2637 [0.0274]		-0.0257 [0.7296]	0.2902 [0.0001]	-0.0746 [0.3100]	-0.0428 [0.5608]
LTASSET	0.2289 [0.0483]	0.3593 [0.0017]	-0.2024 [0.0979]		-0.1416 [0.0519]	0.4574 [0.0001]	0.2316 [0.0013]
ZSCORE	0.0434 [0.7177]	0.0971 [0.4207]	-0.0637 [0.6139]	-0.2342 [0.0462]		0.0120 [0.8700]	-0.0312 [0.6700]
DIP	0.0286 [0.8049]	0.1587 [0.1711]	-0.1535 [0.2047]	0.4558 [0.0001]	-0.0529 [0.6568]		0.1099 [0.1270]
PREPACK	0.1500 [0.1928]	-0.0843 [0.4689]	0.1213 [0.3172]	0.0591 [0.6124]	-0.1943 [0.0995]	-0.0296 [0.7971]	

We calculate cumulative abnormal returns (ARs) as the percentage difference between the closing bid/ask midpoint or closing price on the day preceding the first day of the event window and the closing bid/ask midpoint or closing price on the final day of the event window, less the CRSP equally weighted return for the event window. AR[-1,+1] represents the abnormal return over days -1 to +1, where day 0 is the bankruptcy petition filing date. Likewise, AR[+2,+5] and AR[+6,+10] represent the abnormal return over days +2 to +5, and days +6 to +10, respectively. For firms with no recorded trade on the day preceding the first day of the event window or the last day of the event window, the abnormal returns are calculated using the first and last recorded trade during the event window. LTASSET is the log of the firm's total assets as of the fiscal year-end preceding bankruptcy. ZSCORE measures a firm's financial condition at the fiscal year-end preceding bankruptcy, computed using Altman's (1968, 52) Z-score, where higher scores indicate stronger financial condition. DIP is an indicator variable equal to 1 if the firm received debtor-in-possession financing by day +10, and 0 otherwise. PREPACK is an indicator variable equal to 1 if the firm filed a prepackaged bankruptcy, and 0 otherwise. (Two-tailed) p-values appear in brackets.

TABLE 3

Regressions of Abnormal Returns in the Immediate Post-Bankruptcy Filing Period (Days +2 to +5) on the Bankruptcy Filing Period Abnormal Returns (Days –1 to +1) and Control Variables (t-statistics in parentheses)

Model 1: $AR[+2,+5] = \alpha_0 + \alpha_1 AR[-1,+1] + \alpha_2 LTASSET + \alpha_3 ZSCORE + \alpha_4 DIP + \alpha_5 PREPACK + \varepsilon$

Variables	Predicted Signs	Returns Based on Closing Transaction Price	Returns Based on Closing Bid	Returns Based on Closing Bid/Ask Midpoint
Panel A: 1993-2003				
Intercept		-24.42 (-2.88)	-27.59 (-3.05)	-19.80 (-2.51)
AR[-1,+1]	-	-0.18 (-2.29)	-0.23 (-2.82)	-0.15 (-2.07)
LTASSET	+	4.74 (3.17)	5.05 (3.17)	4.01 (2.88)
ZSCORE	+	-0.24 (-0.15)	-0.27 (-0.16)	-0.83 (-0.56)
DIP	+	1.39 (0.23)	1.29 (0.20)	-0.62 (-0.11)
PREPACK	+	-2.04 (-0.23)	-2.81 (-0.28)	-8.88 (-1.03)
Adjusted R^2		4.71%	5.47%	3.89%
Panel B: 1993-1999				
Intercept		-34.81 (-3.06)	-47.53 (-3.97)	-28.90 (-3.11)
AR[-1,+1]	-	-0.67 (-5.97)	-0.70 (-5.90)	-0.44 (-4.51)
LTASSET	+	6.01 (2.65)	8.12 (3.42)	5.41 (2.94)
ZSCORE	+	-2.07 (-1.15)	-2.14 (-1.13)	-2.25 (-1.55)
DIP	+	3.43 (0.43)	9.21 (1.09)	3.41 (0.52)
PREPACK	+	6.37 (0.53)	8.21 (0.59)	0.52 (0.05)
Adjusted R^2		17.00%	20.46%	13.36%
Panel C: 2000-2003				
Intercept		-45.71 (-2.56)	-45.95 (-2.95)	-35.02 (-2.44)
AR[-1,+1]	-	0.13 (1.20)	0.10 (1.11)	0.15 (1.60)
LTASSET	+	6.30 (2.72)	5.34 (2.61)	4.26 (2.26)
ZSCORE	+	8.65 (1.39)	10.08 (1.88)	8.58 (1.75)
DIP	+	1.37 (0.14)	-2.19 (-0.25)	-1.77 (-0.22)
PREPACK	+	-2.90 (-0.21)	1.82 (0.15)	-7.43 (-0.66)
Adjusted R^2		12.80%	12.01%	11.73%

Panel D: Difference in parameter estimates for 1993-1999 (Panel A) versus 2000-2003 (Panel B). T-statistics for tests of the significance of the differences appear in parentheses.

	Diff. (t-statistic)	Diff. (t-statistic)	Diff (t-statistic)
AR[-1,+1]	-0.81 (-4.18)	-0.80 (-3.98)	-0.58 (-3.48)
LTASSET	-0.21 (-0.05)	2.77 (0.68)	1.15 (0.36)
ZSCORE	-10.90 (-2.26)	-12.22 (-2.72)	-10.84 (-2.83)
DIP	2.35 (0.17)	11.39 (0.77)	5.19 (0.44)
PREPACK	9.64 (0.45)	6.39 (0.27)	7.95 (0.42)

We calculate cumulative abnormal returns (ARs) based on closing transaction prices in column 1, closing bids in column 2, and the closing bid/ask midpoint in column 3. In column 1, we calculate abnormal returns for a given firm as the percentage difference between the closing stock price on the day preceding the first day of the event window and the closing stock price on the final day of the event window, less the CRSP equally-weighted return for the event window. Abnormal returns in columns 2 and 3 are calculated similarly using either closing bids or the closing bid/ask midpoint. AR[+2,+5] represents the abnormal return over days +2 to +5. Likewise, AR[-1,+1] represents the abnormal returns over days –1 to +1, where day 0 is the bankruptcy petition filing date. LTASSET is the log of the firm's total assets as of the fiscal year-end preceding bankruptcy. ZSCORE measures a firm's financial condition as of the fiscal year-end preceding bankruptcy, computed using Altman's (1968, 52) Z-score, where higher Z-scores indicate stronger financial condition. DIP is an indicator variable equal to 1 if the firm received debtor-in-possession financing, and 0 otherwise. PREPACK is an indicator variable equal to 1 if the firm filed a prepackaged bankruptcy, and 0 otherwise. t-statistics appear in parentheses.

TABLE 4

Regressions of Abnormal Returns in the Subsequent Post-Bankruptcy Filing Period (Days [+6,+10]) on the Immediate Post-filing Period Abnormal Returns (Days [+2,+5]), and Control Variables (t-statistics in parentheses)

$$Model\ 2:\ AR[+6,+10] = \beta_0 + \beta_1 AR[+2,+5] + \beta_2 AR[-1,+1] + \beta_3 LTASSET$$
$$+ \beta_4 ZSCORE + \beta_5 DIP + \beta_6 PREPACK + \tau$$

Variables	Predicted Signs	Returns Based on Closing Transaction Price	Returns Based on Closing Bid	Returns Based on Closing Bid/Ask Midpoint
Panel A: 1993-2003				
Intercept		-16.22 (-2.91)	-13.15 (-1.98)	-8.36 (-1.42)
AR[+2,+5]	-	-0.10 (-2.75)	-0.14 (-3.33)	-0.10 (-2.25)
AR[-1,+1]	-	-0.06 (-1.17)	-0.10 (-1.64)	-0.04 (-0.74)
LTASSET	+	0.74 (0.76)	0.32 (0.27)	-0.05 (-0.04)
ZSCORE	+	5.48 (5.33)	5.52 (4.61)	5.28 (4.90)
DIP	+	-4.61 (-1.19)	-2.21 (-0.48)	-5.46 (-1.32)
PREPACK	+	2.63 (0.46)	0.99 (0.14)	2.07 (0.33)
Adjusted R^2		11.87%	11.30%	11.13%
Panel B: 1993-1999				
Intercept		-25.33 (-3.42)	-22.51 (-2.53)	-16.21 (-1.93)
AR[+2,+5]	-	-0.15 (-3.15)	-0.16 (-3.05)	-0.13 (-2.27)
AR[-1,+1]	-	-0.19 (-2.51)	-0.20 (-2.14)	-0.11 (-1.32)
LTASSET	+	2.33 (1.59)	2.04 (1.17)	1.43 (0.92)
ZSCORE	+	5.53 (4.88)	5.83 (4.34)	5.48 (4.54)
DIP	+	-4.01 (-0.80)	-3.41 (-0.57)	-5.84 (-1.08)
PREPACK	+	1.49 (0.19)	-0.19 (-0.26)	-0.68 (-0.08)
Adjusted R^2		15.57%	13.19%	11.96%
Panel C: 2000-2003				
Intercept		-0.59 (-0.06)	7.84 (0.66)	3.49 (0.33)
AR[+2,+5]	-	-0.09 (-1.39)	-0.14 (-2.05)	-0.08 (-1.19)
AR[-1,+1]	-	0.08 (1.42)	0.05 (0.86)	0.05 (0.83)
LTASSET	+	-0.82 (-0.63)	-1.94 (-1.32)	-1.33 (-1.01)
ZSCORE	+	-2.03 (-0.60)	-3.70 (-0.97)	-2.59 (-0.77)
DIP	+	-3.01 (-0.58)	2.00 (0.34)	-3.26 (-0.62)
PREPACK	+	2.38 (0.33)	-0.11 (-0.01)	3.82 (0.53)
Adjusted R^2		0.39%	6.21%	0.94%

Panel D: Difference in parameter estimates for 1993-1999 (Panel A) versus 2000-2003 (Panel B). T-statistics for tests of the significance of the differences appear in parentheses.

	Diff. (t-statistic)	Diff. (t-statistic)	Diff (t-statistic)
AR[+2,+5]	-0.06 (-0.68)	-0.02 (-0.23)	-0.05 (-0.49)
AR[-1,+1]	-0.27 (-2.08)	-0.25 (-1.58)	-0.16 (-1.11)
LTASSET	3.15 (1.25)	3.99 (1.31)	2.76 (1.01)
ZSCORE	7.56 (2.73)	9.53 (2.98)	8.07 (2.83)
DIP	-1.00 (-0.11)	-5.41 (-0.51)	-2.58 (-0.27)
PREPACK	-0.89 (-0.07)	-0.09 (-0.00)	-4.50 (-0.29)

We calculate cumulative abnormal returns (ARs) based on: closing transaction prices in column 1, closing bids in column 2, and the closing bid/ask midpoint in column 3. In column 1, we calculate abnormal returns for a given firm as the percentage difference between the closing stock price on the day preceding the first day of the event window and the closing stock price on the final day of the event window, less the CRSP equally-weighted return for the event window. Abnormal returns in column 2 and 3 are calculated similarly using either closing bids or the closing bid/ask midpoint. AR[+6,+10] represents the abnormal return over days +6 to +10. Likewise, AR[+2,+5] and   AR[-1,+1] represent the abnormal returns over days +2 to +5 and -1 to +1, respectively, where day 0 is the bankruptcy petition filing date. LTASSET is the firm's total assets as of the fiscal year-end preceding bankruptcy. ZSCORE measures a firm's financial condition as of the fiscal year-end preceding bankruptcy, computed using Altman's (1968, 52) Z-score, where higher Z-scores indicate stronger financial condition. DIP is an indicator variable equal to 1 if the firm received debtor-in-possession financing, and 0 otherwise. PREPACK is an indicator variable equal to 1 if the firm filed a prepackaged bankruptcy, and 0 otherwise. t-statistics appear in parentheses.

TABLE 5

Differences between Small versus Large Traders' Abnormal Trading Responses Around and After Bankruptcy Filing Dates

Panel A: Days -1 to +1

Definitions of small and large trades	Measure	1993 to 2003 (N = 247)			1993 to 1999 (N = 176)			2000 to 2003 (N = 71)		
		SMATRD	LGATRD	Difference	SMATRD	LGATRD	Difference	SMATRD	LGATRD	Difference
Small ≤ 500 shares Large ≥ 3,000 shares	Mean	308.76	1455.46	5.57***	254.63	840.86	5.01***	436.37	2904.17	4.10***
	Median	133.62	401.41	6.73***	121.95	337.21	5.61***	215.11	635.73	4.04***
Small < 1,000 shares Large ≥ 1,000 shares	Mean	326.24	723.25	4.80***	269.67	548.27	3.24***	466.48	1157.01	3.77***
	Median	148.75	278.94	4.40***	127.76	239.30	4.05***	238.10	507.94	1.84*

Panel B: Days +2 to +5

Definitions of small and large trades	Measure	1993 to 2003 (N = 191)			1993 to 1999 (N = 132)			2000 to 2003 (N = 59)		
		SMATRD	LGATRD	Difference	SMATRD	LGATRD	Difference	SMATRD	LGATRD	Difference
Small ≤ 500 shares Large ≥ 3,000 shares	Mean	184.88	787.53	4.78***	155.79	491.82	3.76***	248.06	1429.93	3.51***
	Median	82.30	218.28	4.46***	74.54	166.67	3.27***	100.34	296.39	2.59***
Small < 1,000 shares Large ≥ 1,000 shares	Mean	209.12	409.60	3.39***	184.36	281.98	1.87*	264.51	695.11	2.95***
	Median	86.12	153.85	2.96***	80.03	129.24	2.70***	131.50	240.64	2.02**

TABLE 5 (Cont'd)

Panel C: Days +6 to +10

Definitions of small and large trades	Measure	1993 to 2003 (N = 114)			1993 to 1999 (N = 79)			2000 to 2003 (N = 35)		
		SMATRD	LGATRD	Difference	SMATRD	LGATRD	Difference	SMATRD	LGATRD	Difference
Small ≤ 500 shares Large ≥ 3,000 shares	Mean	147.73	464.33	3.20***	125.22	352.44	2.95***	197.39	711.17	1.94*
	Median	84.04	140.00	2.84***	78.18	128.57	2.44**	135.24	155.12	0.48
Small < 1,000 shares Large ≥ 1,000 shares	Mean	164.56	295.16	2.44**	142.15	241.11	1.88*	215.15	417.16	1.60
	Median	89.87	123.69	2.11**	83.72	101.21	1.76*	127.17	132.71	0.24

*** α ≤ 0.01, two-tailed
 ** α ≤ 0.05, two-tailed
  * α ≤ 0.10, two-tailed

We measure small traders' abnormal trading response based on the number of transactions. SMATRD for the [-1,+1] bankruptcy petition filing window centered on the filing date is computed as follows. We count the number of transactions classified as small trades in the [-1,+1] event window. We then divide this number by a non-announcement period benchmark, consisting of seven consecutive three-day observation windows (i.e., 21 trading days) spanning approximately a month starting six months before the bankruptcy filing date. We then count the number of small trades in each of these seven consecutive three-day windows. The median of these seven observations is the non-announcement period benchmark. If a firm has no small trades in any of the seven three-day non-announcement period observation windows, the firm is dropped to avoid division by zero. SMATRD values for the [+2,+5] and [+6,+10] windows are calculated similarly. Likewise, we calculate large traders' abnormal trading response based on the number of transactions classified as large (LGATRD). To test the difference in means we use a t-statistic for unequal variances if the folded F-test indicates it is appropriate; otherwise we use the t-statistic for equal variances. For testing the difference in medians we use the non-parametric median test, and the test statistic is a Z-statistic.

REFERENCES

Aharony, J., C. P. Jones, and I. Swary. "An Analysis of Risk and Return Characteristics of Corporate Bankruptcy Using Capital Market Data." *Journal of Finance* 35 (1980), 1001-1016.

Altman, E. "Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy." *Journal of Finance* 23 (1968), 589-609.

Atkins, A., and E. A. Dyl. "Price Reversals, Bid-Ask Spreads, and Market Efficiency." *Journal of Financial and Quantitative Analysis* 25 (1990), 535-548.

Bamber, L. S. "Unexpected Earnings, Firm Size, and Trading Volume Around Quarterly Earnings Announcements." *The Accounting Review* 62 (1987), 510-532.

Barber, B. M., and D. Loeffler. "The "Dartboard" Column: Second-hand Information and Price Pressure." *Journal of Financial and Quantitative Analysis* 28 (1993), 273-284.

Barber, B. M., and T. Odean. "Trading is Hazardous to Your Wealth: the Common Stock Investment Performance of Individual Investors." *The Journal of Finance* (April), 773-806.

Belsley, D. A., E. Kuh, and R. E. Welsch. 1980. *Regression Diagnostics*, New York: John Wiley & Sons, Inc.

Bernard, V. and J. Thomas. "Evidence that Stock Prices Do Not Fully Reflect the Implications of Current Earnings for Future Earnings." *Journal of Accounting and Economics* 13 (1990), 305-340.

Bessembinder, H., and H. M. Kaufman. "A Cross-Exchange Comparison of Execution Costs and Information Flow for NYSE-Listed Stocks." *Journal of Financial Economics* 46 (1997a), 293-319.

Bessembinder, H., and H. M. Kaufman. "A Comparison of Trade Execution Costs for NYSE and NASDAQ-Listed Stocks." *Journal of Financial and Quantitative Analysis* 32 (1997b), 287-310.

Betker, B. "An Empirical Examination of Prepackaged Bankruptcy." *Financial Management* 24 (1995), 3-18.

Bhattacharya, N. "Investors' Trade Size and Trading Responses Around Earnings Announcements: An Empirical Investigation." *The Accounting Review* 76 (2001), 221-244.

Bloomfield, R., R. Libby, and M. Nelson. "Underreactions, Overreactions, and Moderated Confidence." *Journal of Financial Markets* 3 (2000), 113-137.

Bremer, M., T. Hiraki, and R. J. Sweeney. "Predictable Patterns After Large Stock Price Changes on the Tokyo Stock Exchange." *Journal of Financial and Quantitative Analysis* 32 (1997), 345-365.

Bremer, M., and R. J. Sweeney. "The Reversal of Large Stock Price Decreases." *Journal of Finance* 46 (1991), 747-754.

Brown, K. C., W.V. Harlow, and S. M. Tinic. "Risk Aversion, Uncertain Information, and Market Efficiency." *Journal of Financial Economics* 22 (1988), 355-385.

Bryant, L., S. Henning, and W. Shaw, "Alternative Earnings Measures, Key Performance Indicators, and Firm Value in the IT Professional Services Sector," Working paper, Southern Methodist University, 2003.

Bushee, B., D. Matsumoto, and G. Miller, "Open versus Closed Conference Calls: The Determinants and Effects of Broadening Access to Disclosures," *Journal of Accounting and Economics* 34 (January 2003), 149-180.

Chakravarty, S. "Stealth-Trading: Which Trader's Trades Move Stock Prices." *Journal of Financial Economics* 61 (2001): 289-307.

Chan, L. K. C., and J. Lakonishok. "Institutional Trades and Intraday Stock Price Behavior." *Journal of Financial Economics* 33 (1993), 173-200.

Chatterjee, S., U. Dhillon, and G. Ramirez. "Resolutions of Financial Distress: Debt Restructurings via Chapter 11, Prepackaged Bankruptcies, and Workouts." *Financial Management* 25 (1996), 5-18.

Chopra, N., J. Lakonishok, and J. R. Ritter. "Measuring Abnormal Performance: Do Stocks Overreact?" *Journal of Financial Economics* 31 (1992), 235-268.

Clark, T. A., and M. I. Weinstein, "The Behavior of the Common Stock of Bankrupt Firms." *Journal of Finance* 38 (1983), 489-504.

Cornell, B., and E. R. Sirri. "The Reaction of Investors and Stock Prices to Insider Trading." *Journal of Finance* 47 (1992), 1031-1060.

Cox, D. R., and D. R. Peterson. "Stock Returns Following Large One-day Declines: Evidence on Short-term Reversals and Longer-term Performance." *Journal of Finance* 49 (1994), 255-268.

Dahiya, S., K. John, M. Puri, and G. Ramirez. "Debtor-in-Possesion Financing and Bankruptcy Resolution: Empirical Evidence." *Journal of Financial Economics* 69 (2003), 259-280.

Daniel, K., D. Hirshleifer, and A. Subrahmanyam. "Investor Psychology and Security Market Under- and Overreactions." *Journal of Finance* 53 (1998), 1839-1885.

Datta, S., and M. E. Iskandar-Datta. "The Information Content of Bankruptcy Filing on Securityholders of the Bankrupt Firm: An Empirical Investigation." *Journal of Banking and Finance* 19 (1995), 903-919.

DeBondt, W. F.M., and R. H. Thaler. "Does the Stock Market Overreact?" *Journal of Finance* 40 (1985), 793-805.

DeBondt, W. F.M., and R. H. Thaler. "Further Evidence on Investor Overreaction and Stock Market Seasonality." *Journal of Finance* 42 (1987), 557-581.

Demers, E. and P. Joos, "A Tale of Two 'Bubbles': The Rise and Fall of Internet and Biotechnology Stocks," Working paper, University of Rochester, 2004.

Demers, E., and B. Lev, "A Rude Awakening: Internet Shakeout in 2000," *Review of Accounting Studies* 6, (2001), 331-359.

Dhillon, U., and H. Johnson. "Changes in the Standard and Poor's 500 List." *Journal of Business* 64 (1991), 75-86.

Easley, D., and M. O'Hara. "Price, Trade Size, and Information in Securities Markets." *Journal of Financial Economics* 19 (1987), 69-90.

Freeman, R. and S. Tse. "The Multiperiod Information Content of Accounting Earnings: Confirmations and Contradictions of Previous Earnings Reports," *Journal of Accounting Research* 27 (1989), 49-79.

Fung, A., D. Mok, and K. Lam. "Intraday Price Reversals for Index Futures in the U.S. and Hong Kong." *Journal of Banking and Finance* 24 (2000), 1179-1201.

Gervais, S., and T. Odean. "Learning to Be Overconfident." *Review of Financial Studies* 14 (2001), 1-27.

Greene, W. H., 2000, 4th edition. *Econometric Analysis*. Englewood Cliffs, N.J.: Prentice Hall.

Griffin, D., and A. Tversky, "The Weighing of Evidence and the Determinants of Confidence," *Cognitive Psychology* 24 (1992), 411-435.

Harris, L., and E. Gurel. "Price and Volume Effects Associated With Changes in the S&P 500 List: New Evidence for the Existence of Price Pressures." *Journal of Finance* 41 (1986), 815-830.

Hubbard, J., and K. Stephenson. "A Fool and His Money: Buying Bankrupt Stocks." *Journal of Investing* 6 (1997), 56-59.

Ikenberry, D., J. Lakonishok, and T. Vermalean. "Market Underreaction to Open Market Share Repurchases." *Journal of Financial Economics* 39 (1995), 181-208.

Ikenberry, D., G. Rankine, and E. Stice. "What Do Stock Splits Really Signal?" *Journal of Financial and Quantitative Analysis* 31 (1996), 357-375.

Ikenberry, D. L., and S. Ramnath, "Underreaction to Self-Selected News Events: The Case of Stock Splits," *Review of Financial Studies* 15 (2002), 489-526.

Kahneman D., and A. Tversky, "On the Psychology of Prediction," *Psychological Review* 80 (1973), 237-251.

Kyle, A.S. "Continuous Auction and Insider Trading." *Econometrica* 53 (1985), 1315-1335.

Kyle, A., and A. Wang. "Speculation Duopoly with Agreement to Disagree: Can Overconfidence Survive the Market Test?" *Journal of Finance* 52 (1997), 2073-2090.

Lakonishok, J. and I. Lee. "Are Insider Trades Informative? *Review of Financial Studies* 14 (Spring 2001), 79-111.

Lakonishok, J., A. Shleifer, R. Thaler, and R. Vishy. "Window Dressing by Pension Fund Managers." *American Economic Review* 81 (1991), 227-231.

Lamourex, C. G., and J. W. Wansley. "Market Effects of Changes in the Standard and Poor's 500 Index." *The Financial Review* 22 (1987), 53-70.

Lang, L., and R. Stultz. "Contagion and Competitive Intra-industry Effects of Bankruptcy Announcements." *Journal of Financial Economics* 32 (1992), 45-60.

Lee, C. M. C., and B. Radhakrishna. "Inferring Investor Behavior: Evidence from TORQ Data." *Journal of Financial Markets* 3 (2000), 83-111.

Lee, C. M. C., and M. J. Ready. "Inferring Trade Direction from Intraday Data." *Journal of Finance* 46 (1991), 733-746.

Liu, P., S. D. Smith, and A. A. Syed. "Stock Price Reactions to *The Wall Street Journal's* Securities Recommendations." *Journal of Financial and Quantitative Analysis* 25 (1990), 399-410.

Loughran, T., and J. R. Ritter. "The Operating Performance of Firms Conducting Seasoned Equity Offerings." *Journal of Finance* 52 (1997), 1823-1850.

Loughran T. and J.R. Ritter, "Why Don't Issuers Get Upset About Leaving Money on the Table in IPOs?" *Review of Financial Studies* 15 (2002), 413-443.

Loughran T., and J. Ritter, "Why Has IPO Underpricing Changed Over Time?" *Financial Management* (Autumn 2004), 5-37.

McEnally, R. W., and R. B. Todd. "Systematic Risk Behavior of Financially Distressed Firms." *Quarterly Journal of Business and Economics* 32 (1993), 3-19.

Mendenhall, R. "Evidence on the Possible Underweighting of Earnings-Related Information." *Journal of Accounting Research* 29 (1991), 170-179.

Michaely, R., R. Thaler, and K. Womack. "Price Reactions to Dividend Initiations and Omissions: Overreaction or Drift?" *Journal of Finance* 50 (1995), 573-608.

Morse, and W. Shaw. "Investing in Bankrupt Firms." *Journal of Finance* 43 (1988), 1193-1206.

Nelson, M., R. Bloomfield, J. Hales, and R. Libby. "The Effect of Information Strength and Weight on Behavior in Financial Markets." *Organizational Behavior and Human Decision Processes* 86 (2001), 168-196.

Odean, T., "Volume, Volatility, Price, and Profit When All Traders Are Above Average." *Journal of Finance* 53 (1998), 1887-1934.

Park, J. "A Market Microstructure Explanation for Predictable Variations in Stock Returns Following Large Price Changes." *Journal of Financial and Quantitative Analysis* 30 (1995), 241-256.

Pari, R. "Wall $treet Week Recommendations: Yes or No?" *Journal of Portfolio Management* 13 (1987), 74-76.

Rozeff, M. S., and M. A. Zaman. "Overreaction and Insider Trading: Evidence from Growth and Value Portfolios." *Journal of Finance* 53 (1998), 701-716.

Schleifer, A. "Do Demand Curves for Stocks Slope Down?" *Journal of Finance* 41 (1986), 579-590.

Shiller, R. J. "Conversation, Information, and Herd Behavior." *American Economic Review* 85 (1995), 181-185.

Shiller, R. J. "Bubbles, Human Judgment and Expert Opinion." *Financial Analysts Journal* 58 (2002), 18-26.

Slezak, S. "On the Impossibility of Weak-Form Efficient Markets." *Journal of Financial and Quantitative Analysis* 39 (2003), 523-554.

Tashjian, E., R. Lease, and J. McConnell. "Prepacks: An Empirical Analysis of Prepackaged Bankruptcies." *Journal of Financial Economics* 40 (1996), 135-162.

Womack, K. "Do Brokerage Analysts' Recommendations Have Investment Value?" *Journal of Finance* 51 (1996), 137-168.

Zarowin, P. "Size, Seasonality, and Stock Market Overreaction." *Journal of Financial and Quantitative Analysis* 25 (1990), 113-126.

Zmijewski, M. E.. "Methodological Issues Related to the Estimation of Financial Distress Prediction Models." *Journal of Accounting Research* 22 (Supplement, 1984), 59-86.