H. Nejat Seyhun
University of Michigan

Michael Bradley
Duke University

Corporate Bankruptcy and Insider Trading*

We document significant sales by the insiders of firms filing bankruptcy petitions prior to the filing date. We also find that selling is more intense for top executives and officers and that insiders in general systematically sell stock before prices fall and buy stock after prices have fallen. Although this trading pattern may simply reflect an implicit compensation arrangement between insiders and stockholders, the significant sell-off does raise potential questions regarding managements' incentives to maximize shareholder wealth throughout the Chapter 11 process.

I. Introduction

The unprecedented number of corporate bankruptcies over the past 5 years has spurred a vigorous debate concerning the efficiency of the current bankruptcy process.[1] A major issue in this debate is whether the managers of financially troubled corporations have the proper incentives to maximize the value of their firms' common equity in the period just prior to a bankruptcy filing and throughout the reorganization process.

It has long been recognized that the incentives of corporate managers and stockholders are more aligned when managers hold stock in the firms they manage.[2] Empirical evidence indicates that inside ownership has an important influence on a host of corporate activities and events.[3] Most of the empirical literature relies on the fraction of shares held by management as reported in proxy

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1. See Bradley and Rosenzweig (1995) and references cited therein.

2. Jensen and Meckling (1976).

3. Examples include Barclay and Holderness (1989), Brickley, Lease, and Smith (1988), DeAngelo and DeAngelo (1985), Demsetz (1986), Gilson (1989), LoPucki and Whitford (1990), McConnell and Servaes (1990), Morck, Shleifer, and Vishny (1988), and Stulz (1988).

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statements in the years surrounding the event under study as a measure of management's allegiance to the firm's stockholders. However, there is an important limitation to using this metric as a proxy for management's fidelity to stockholders: managers can change their holdings just prior to the event. Moreover, managers can reverse their trades after an event and report no net change from one year to the next. The possibility of trading around an event permits managers to decouple effectively their incentives from the other stockholders and underscores the importance of restricted stock, bonuses, phantom stock and stock options, that is, inalienable securities, in aligning the interests of managers and stockholders.

At least two papers present empirical evidence that corporate managers do not sell their insider holdings prior to filing a bankruptcy petition (Loderer and Sheehan 1989; Gosnell, Keown, and Pinkerton 1992). These researchers conclude that managers of bankrupt firms do not ''bail out'' on their stockholders prior to filing, although they do not speculate whether the absence of insider trading is due to the ignorance or integrity of corporate managers or their fear of insider trading laws.

Given the literature on insider trading and the literature on corporate bankruptcy, the absence of insider trading prior to a financial disaster is surprising. The empirical literature on insider trading clearly demonstrates that corporate managers possess valuable information regarding the future price of their firms' securities. Typically, corporate insiders sell (postpone purchases) before significant stock-price decreases and buy (postpone sales) before significant price increases (Jaffe 1974; Seyhun 1986).[4] From the literature on corporate bankruptcies it is equally clear that equity holders suffer significant capital losses in the years preceding a filing (Clark and Weinstein 1983; and Bradley and Rosenzweig 1992). The fact that corporate insiders are either unable or unwilling to sell their shares in advance of a financial crisis is puzzling and counterintuitive.

In this article we present evidence that is inconsistent with the above findings. Using a much larger sample that includes the record number of corporate bankruptcies filed in 1990 and 1991, and insider trading activity reported to the Securities and Exchange Commission (SEC) on a daily basis, we present evidence that insiders do in fact sell their holdings of their firms' shares prior to filing a bankruptcy petition and thereby avoid significant capital losses.

We begin by documenting the returns to the stockholders of firms

4. Other recent studies of the information content of insider trading include Hirschey and Zaima (1989)—selloffs; Seyhun (1990)—takeovers; John and Lang (1991) and Ku and Westerfield (1992)—dividend policy; and Lee, Mikkelson, and Partch (1992)—share repurchases. In general, these studies conclude that corporate insiders possess significant, nonpublic information and are able to exploit this informational advantage by trading with uninformed investors.

that file bankruptcy petitions. Consistent with the existing literature, we find that stockholders suffer significant losses in the months and years preceding the filing date. Indeed, we document significant losses for these firms 4 years before the bankruptcy filing. We go on to show that corporate insiders engage in significant sales of their firms' stock in the months and even years preceding a bankruptcy petition. We find that insider selling begins 5 years before the filing date and builds to a crescendo up to the announcement month. We also find that selling is more intense for top executives and officers. Finally, we show that insiders sell stock before prices fall and buy stock after prices have fallen.

In sum we find that corporate insiders engage in significant sales prior to filing a bankruptcy petition and, as a result, avoid significant capital losses. This fact alone, however, does not necessarily mean that these managers have breached their fiduciary duty to their shareholders. Carlton and Fischel (1983) have argued that insider trading is an efficient means for compensating corporate executives. They argue that managers are in a better position than stockholders to exploit inside information, since announcing their private information to stockholders would also alert other market participants and thereby eliminate any profit opportunity. Consequently, decreasing managers' wages by the expected profits from insider trading is an efficient trade-off for both managers and stockholders. Moreover, since managers' wages are typically reduced in times of financial distress (Gilson and Vetsuypens 1993), selling stock may be necessary to support current consumption. Alternatively, insider sales can be due to the increase in the conditional variance of stock returns as bankruptcy approaches. As a result, insiders find it optimal to hold less of the firm's stock.

Regardless of their motivation, however, it is nevertheless true that corporate insiders who reduce their holdings of their firm's shares just prior to filing a bankruptcy petition have, at least to some extent, less of an incentive to maximize shareholder value throughout the Chapter 11 process. Betker (1995) provides direct evidence that stockholders' gains in Chapter 11 are directly related to insiders' holdings.

It is generally recognized that Chapter 11 was intended to give the managers of financially troubled firms greater power to bargain on behalf of their stockholders in dealing with their firms' creditors (Bradley and Rosenzweig 1992). It is quite possible that insider sales before bankruptcy frustrates this intent of public policy.

The empirical evidence reported in this article is important beyond the insights it provides into managements' incentives throughout the bankruptcy process. The data provide an important vindication of the informational content of insider trading in general. Recently, the Lodderer and Sheehan results have been cited as evidence that either insiders do not have privileged information or, if they do, insider trading sanc-

tions are sufficient to keep them from trading on that information (Bhattacharya and Spiegel 1991). Some commentators reason that if insiders do not trade on information pertaining to an impending bankruptcy filing, then they probably do not trade in advance of other less important corporate events either. Thus, the results reported in this article have implications regarding the importance of and public policy toward insider trading sanctions in general.

II. The Existing Literature on Insider Trading in Bankrupt Firms

Loderer and Sheehan (1989) examine the change in insider holdings of firms that filed a bankruptcy petition between 1971 and 1985. They collect their insider holding data from proxy statements. Because of this selection technique, their sample contains mostly large, exchange-listed firms. Their major finding is that there is no statistical change in the holdings of the insiders of firms that file bankruptcy over the 5 years preceding the filing date. Based on the finding of no difference in reported holdings, they conclude that there is no significant insider trading activity in the years preceding a bankruptcy filing and certainly no significant amount of selling.

While it is logical to conclude that a constant year-end inventory of shares is evidence of no trading, insider trading can occur nevertheless. We show that insiders are both sellers and buyers over the 5 years preceding a bankruptcy filing. We also show that insiders ''time'' their trades—selling before prices fall and buying after they have fallen. Thus, insiders, by selling high and buying low, can significantly reduce their investment in the firm while maintaining a constant inventory of shares.

There are other limitations from the use of data gathered exclusively from proxy statements. The authors report that 30% of the potential proxies are not available. No doubt there is a positive relation between the well-being of a firm and whether the firm files a proxy statement. The managers of firms with zero equity values have little incentive to file a proxy statement.[5] Indeed, the authors report only 40 observations in the year of filing. Thus, their fundamental conclusion of no insider selling is actually based on a sample of only 40 firms. Since most insider selling takes place in the year just before filing, their sample is particularly limited in the event year that contains the most information.

Finally, Loderer and Sheehan use as a control sample the insider trading activity of comparably sized competitors 5 years before filing.

5. Proxy statements are needed only for actions that require stockholder approval. Since stockholder approval is not required for filing a bankruptcy petition, the amount of missing data is not surprising.

Competitors are identified by matching four-digit Standard Industrial Classification (SIC) codes. There are at least two limitations of this benchmark. First, firms filing bankruptcy become significantly smaller as they approach the filing date. Using control firms matched on size 5 years before filing biases the results against detecting insider sales. In general, the insiders of large firms are net sellers and the insiders of small firms are net purchasers (Seyhun 1986).

The second potential limitation of the Loderer and Sheehan control sample is that it is based on the insider trading activity in competitor firms. Since these firms are in the same industries as those in the bankruptcy sample, they are likely to be experiencing financial difficulty as well.[6] Consequently, it is quite possible that the insiders of firms in the Loderer and Sheehan control sample are also engaged in abnormal selling. If this is the case, their measure is biased against detecting any abnormal selling in the sample of bankrupt firms. It should be noted that Loderer and Sheehan find no changes in the holdings of insiders even before adjusting for the amount of insider trading in their control firms. Below we report data that are inconsistent with these findings as well. Since they also find no significant trading in their control firms, their conclusions apply to actual, as well as ''abnormal,'' trading volume.

For our purposes, the important research question is whether the insiders of firms that file bankruptcy sell their shares before filing. It is not whether the insiders of filing firms sell more than the insiders of firms that are in financial distress but do not file a formal bankruptcy petition. The latter is an important issue and one that we address directly in our empirical analysis. However, it is secondary to the more fundamental question of whether the insiders of filing firms sell their shares before the market becomes (fully) aware of the firm's financial condition. Moreover, it is not clear that there would be a difference in the trading behavior of the insiders of failing firms that file for court protection and those that do not. As long as insiders can predict a drop in the firm's stock price, they will have an incentive to sell, whether or not the firm ultimately files for bankruptcy protection.

Gosnell, Keown, and Pinkerton (1992) are also unable to document significant insider sales prior to bankruptcy filings for *exchange-listed firms*. They do find, however, a significant sell-off by the managers of NASDAQ firms that file bankruptcy. They obtain their insider trading data from the SEC's Official Summary of Securities Transactions and Holdings, which is a significant improvement over proxy data. But they only have a sample of 18 exchange-listed firms over 1985–87, which is hardly a sufficient sample to draw any strong conclusions. They also

6. Lang and Stulz (1992).

construct a control-sample by matching each bankrupt firm with a competitor of similar size as of 2 years before filing. Again, we question the use of insider trading activity of competitors to construct an appropriate control sample.

III. Data

Our sample of bankrupt firms is taken from Bradley and Rosenzweig (1995). Their sample consists of 525 firms that filed a voluntary bankruptcy petition between 1963 and 1992 and were listed on either the New York Stock Exchange (NYSE) or American Stock Exchange (AMEX) anytime during this period. These firms have been identified from several sources. First, the fate of all firms that were delisted from either of the major exchanges was examined to identify those firms that filed a voluntary bankruptcy petition. Second, all major news retrieval files were searched using ''bankruptcy,'' ''Chapter 11,'' ''Chapter X,'' and ''Chapter XI'' as keywords.[7]

Data on insider trading activity are taken from the SEC's Official Summary of Securities Transactions and Holdings, January 1975–December 1992. The Bradley-Rosenzweig database contains 425 filings made by 407 separate firms over this 18-year period. Of these 407 firms, 314 firms, filing 324 petitions, are listed on the SEC's insider trading tape. This database contains all reported insider trading activity and includes the date of the trade, the security traded, the price, the number of shares traded, the insider's name, and his/her relation to the firm.[8]

We drop from our analysis the 93 firms in our sample of 407 (23%) that are not listed on the SEC insider trading tape. One might be tempted to conclude that since these firms are not listed on the tape, it must be the case that the insiders of these firms did not trade over this time period. This conclusion is unwarranted for two reasons. First, 26 of the firms in our sample were delisted from the major exchanges before January 1, 1975. The insiders of the delisted firms are not required to report their trades to the SEC.[9] Of the 22 firms filing in 1975,

7. Our data span the passage of the 1978 Bankruptcy Reform Act. Among other things, the act consolidated what was formerly Chapters X and XI into a single Chapter 11. Since our database spans the passage of this legislation, our sample consists of Chapter X and Chapter XI filings before 1979 and Chapter 11 filings thereafter. For our purposes, the distinguishing characteristics among these three ''chapters'' of the two codes are irrelevant. For an examination of the effects of the 1978 Act, see Bradley and Rosenzweig (1992, 1995).

8. All transactions that exceed either the trading volume or the number of shares outstanding for a given firm are deleted. Also deleted are all duplicate, amended, and inconsistent transactions, as well as transactions with invalid dates.

9. Rule 12f-4(c)1 exempts any security for which unlisted trading privileges on a national exchange have been granted from the requirements of Section 16 of the Securities and Exchange Act, including the reporting requirements.

eight were delisted before January 1975, which is the beginning of the SEC insider trading tape. Of the 24 firms filing in 1976, six were delisted before January 1975 and finally, of the 17 firms filing in 1977, two were delisted before January 1975. Hence, excluding the 26 delisted firms, our missing rate is 18% (67 out of 381).

The second reason we are unwilling to assume that firms not listed on the SEC tape had no insider trading is because of the way the data are collected and reported to the SEC. When insiders report their ownership and trading activity to the SEC on Forms 3, 4, and 5, they do not report the CUSIP numbers of their firms. Instead, they report the firm name as a 50-character string. CUSIP numbers are added later by CDA/INVESTNET, which is an independent vendor hired by the SEC, by matching firm names reported by insiders with the 32-character string reported on the CRSP tapes. The 1994 insider trading tapes contain 8,733 firms with unique names. Using a computer matching program, we were able to find a CUSIP number for only 6,855 of these firms (78%). Hence, the overall miss rate (22%) is comparable to the missing rate for our sample of filing firms. In addition, we checked by hand the remaining 1,878 firms against the CRSP names. Of these, we identified an additional 707, bringing the total identified to 7,562, or 87%. To cast further light on this issue, we searched all *small* firms on the SEC tape. Our sample of filing firms have a median market value of equity equal to $8 million. We then identified 3,823 firms on the 1994 CRSP tape that had an equity market value of $100 million or less at the beginning of 1994. Of these smaller firms, we could not find 851 firms (22%) on the insider trading tapes. Once again, this miss rate is higher than the missing proportion of our bankruptcy filing firms. Based on these results, we conclude that the fraction of the bankruptcy filing firms that are missing on the insider trading tape is not unusual, and is the result of delistings and identification errors, rather than the absence of insider trading.

IV. Evidence

A. Corporate Bankruptcies and Stock Prices

We measure the capital loss avoided by the insiders who sell their stock prior to filing a bankruptcy petition by calculating a series of holding period returns to the shares of each firm in our sample. We eschew the standard ‘‘event-study,’’ or cumulative abnormal return (CAR), methodology because of the price behavior of the securities of firms that file for bankruptcy. First, many firms are delisted from the major exchanges in the months and even years before filing (see Bradley and Rosenzweig 1992). In the standard event-study methodology, when a firm is dropped from the sample because of missing data, the value of

the portfolio is rebalanced over the remaining firms. Thus, as the test portfolio approaches event day 0 and the number of firms dropping out of the sample increases, the investment is concentrated in the shares of surviving firms, which imparts a bias to the return to the portfolio. By calculating holding period returns and averaging over only those firms that are still trading, we avoid this rebalancing distortion.

The second problem with the standard event-study methodology is that the price of the shares of many firms that file bankruptcy falls to single digits prior to filing. With prices at single digits, a CAR statistic can be wildly different from the true holding period return. The effect is not unlike the bid-ask bounce discussed by Blume and Stambaugh (1983). For example, suppose a stock is selling for $1.00. The next day the price rises to $2.00, a 100% return. Now suppose that on the next day the price falls back to $1.00, a 50% loss. The 2-day CAR for this firm is a whopping 50% gain, when in fact the holding period return is zero. Our methodology avoids this distortion of the data as well.

In order to abstract from general market movements, we calculate a series of abnormal holding period returns and their *t*-statistics by employing a bootstrap methodology. Bootstrapping is necessary because the distributional characteristics of a 5-year abnormal holding period return cannot be computed from the characteristics of monthly or annual returns that comprise the 5-year holding period return. For every holding period, we match each observation with a firm randomly selected from the universe of CRSP firms. Take, for instance, the holding period $(-60, -49)$, which contains 280 filing firms.[10] For each of these 280 observations, we select a matching control firm from the universe of NYSE, AMEX, and NASDAQ firms and record its 1-year holding-period return for the matching calendar time. The difference in mean return to the filing sample and the control sample constitutes one replication of the distribution of mean abnormal holding period returns. We repeat this procedure 1,000 times for each holding period to obtain the sampling distribution of the mean abnormal returns. The standard errors used in calculating the *t*-statistics for the mean abnormal returns are computed over the 1,000 replications. The grand means of the 1,000 mean abnormal returns are shown in table 1 as the mean abnormal holding period returns.

Table 1 reports the mean abnormal holding period returns to the firms in our sample over several different horizons. Entries at the top of the table report *annual* returns from 5 years before filing through 2

10. Note that this does not mean that all 280 firms reported trading in each of the 12 months in this interval. Rather, there are 280 firms that were traded and listed on the SEC tape over this period.

TABLE 1 Mean Actual and Abnormal Holding Period Returns (in Percent) to the Shares of Firms That Filed a Voluntary Bankruptcy Petition, 1975–92

Horizon	Actual Return, Abnormal Return Number of Firms, *t*-Statistic					
	All Firms		Positive Equity*		Zero Equity*	
−60, −49	23.90,	−1.30	30.90,	5.85	37.74,	12.70
	280,	−.45	107,	1.34	54,	2.00
−48, −37	8.30,	−14.30	18.84,	−2.81	14.58,	−16.20
	289,	−4.86	107,	−2.81	55,	−2.76
−36, −25	3.45,	−18.42	14.58,	−7.47	−1.38,	−24.14
	286,	−6.22	107,	−1.73	56,	−3.92
−24, −13	−17.44,	−38.59	−4.08,	−21.04	−27.07,	−43.01
	279,	−12.91	104,	−5.36	55,	−6.74
−12, −1	−47.82,	−66.32	−37.23	−54.29	−55.02	−65.58
	243,	−20.55	84,	−11.19	48,	−9.72
−6, −1	−37.20,	−44.96	−28.89,	−35.47	−45.66,	−49.45
	244,	−21.62	85,	−11.94	48,	−10.96
0	−28.09,	−29.69	−29.14,	−30.75	−24.28,	−25.86
	223,	−34.52	75,	−20.64	43,	−16.37
1, 12	14.91,	−7.95	16.43,	6.02	−12.63,	−26.59
	81,	−1.49	25,	.61	7,	−1.34
13, 24	7.79,	−8.87	64.85,	48.63	−67.21,	−74.87
	60,	−2.00	15,	4.32	2,	−3.83
−60, 0	−62.82,	−206.4	−48.87,	−143.6	−64.02,	−188.0
	188,	−9.84	64,	−6.11	35,	−4.36
−48, 0	−67.42,	−173.6	−52.34,	−148.7	−72.52,	−155.1
	200,	−11.8	67,	−7.40	36,	−5.33
−36, 0	−69.76	−142.0	−56.72	−88.8	−77.36,	−137.5
	208,	−14.57	69,	−8.04	38,	−6.60
−24, 0	−70.34	−112.4	−59.35	−78.8	−74.38,	−104.6
	214,	−18.74	72,	−12.45	41,	−8.25
−12, 0	−62.75	−82.9	−54.35,	−59.7	−69.86,	−81.7
	221,	−22.11	74,	−17.62	43,	−11.23

NOTE.—Abnormal holding period returns are calculated as the difference between the realized return and the mean return to nonfiling firms in a bootstrap sample. Horizons are stated in calendar months, where event month 0 is the calendar month of filing. Bootstrapped *t*-statistics of the abnormal returns are reported.

* At the time of reorganization or liquidation.

years thereafter. Entries at the bottom of the table show the *cumulative* effect over the 5-year prefiling period. There are four statistics reported in each cell of the table. The first number is the mean actual return, and the second is the mean abnormal return. In the second row we report the maximum number of observations used to calculate the monthly abnormal returns within the indicated interval and the cross-sectional *t*-statistics of the mean abnormal returns.

The data in the table show that investors in our bankrupt sample lost an average of 17% in the second year before filing. In the year before filing they lost another 48%, and in the month of filing the price of their shares fell another 28%. The average cumulative loss from 2 years

before filing through the filing month is 70%. (See the entry corresponding to the horizon −24 to 0).

On a comparable investment basis, these stockholders suffered a significant average abnormal loss of 14% in the fourth year before filing. Recall that our measure of abnormal returns is the difference between the return to investing in a portfolio of firms that eventually file bankruptcy and the average return of the bootstrap distribution. Thus, in the fourth year before filing, the average return to the portfolio of bankrupt firms is 8%. However, the average return to the control portfolio is 22%, yielding an abnormal return of −14%. The average abnormal return in the third year before filing is −18%, in the second year it is −39%, in the first year, it is −66%, and −30% in the month of filing. From 5 years before filing through the filing month, stockholders realized an average abnormal return of −206%. (See the entry corresponding to a horizon of −60 to 0.) The 206% loss reflects the 63% actual loss in the value of the shares of the bankrupt firms and a 143% opportunity cost from not being invested in the ''market portfolio'' over this 5-year period.[11]

In table 1 we also report separately the returns to the stockholders of firms that ultimately are liquidated or reorganized with zero equity and those that are liquidated or reorganized with positive equity. The source of these designations is the 1994 edition of the *Directory of Obsolete Securities*.[12] Because of the limitations of this directory, we

11. As a final check on the unbiasedness of this subsample, we compared the mean abnormal holding period returns to the firms listed on the SEC tapes with the mean abnormal holding period return to the entire sample of 425 firms over a number of holding periods. For these tests, the abnormal holding period return was calculated as the difference in the actual holding period return and the holding period return of the CRSP value-weighted index. If, in fact, the missing firms actually had no insider sales (purchases), then one might suspect that the returns to the shares of the subsample of reporting firms would show a smaller (greater) negative return. However, in none of the 15 holding periods we calculated was there a significant difference between the mean return to the subsample and the mean return to the entire sample. The mean return over the third year before filing was −24.24% for the entire sample and −24.56% for the subsample of firms listed on the SEC tape; for 2 years before, the numbers are −39.77% and −39.60%; from 1 year to 6 months before, the mean returns are −26.26% and −26.74%; and from 6 months to 1 week before filing, the mean returns are −34.94% and −36.19%. Clearly, these data indicate that the subsample of firms listed on the SEC insider trading tape is a random subsample of the entire sample of bankrupt firms.

12. The *Directory of Obsolete Securities* identifies firms that have been liquidated or reorganized. If the firm has been liquidated, the date of the liquidation is reported. Also reported is whether there was a positive equity position at that time. The database also reports whether the firm has been reorganized or acquired and explicitly states if the value of the firm's equity was zero at that time. We group all firms that emerged from bankruptcy, all firms that changed their name after filing bankruptcy, and all firms that were acquired after filing into the general category of reorganizations. We group all firms that were explicitly liquidated or adjudicated bankrupt into the general category of liquidations. For all firms, in each category, we record whether or not the equity had any value at the time of the resolution of the bankruptcy proceeding.

TABLE 2 Number of Firms Whose Insiders Are Net Buyers, Nontraders, or Net Sellers around the Filing of a Bankruptcy Petition, 1975–92

Horizon	Net Buyers, No Trades, Net Sellers			
	Total	All Insiders	Officers	Top Executives
−60, −49	272	60, 117, 95	56, 119, 97	30, 205, 37
−48, −37	286	90, 102, 94	87, 105, 94	36, 211, 39
−36, −25	287	110, 90, 87	105, 95, 87	34, 216, 37
−24, −13	286	86, 92, 108	85, 105, 96	32, 218, 36
−12, −1	282	56, 119, 107	60, 124, 98	31, 213, 38
−60, −1	324	126, 38, 160	122, 44, 158	70, 147, 107
0	237	11, 206, 20	8, 211, 18	2, 233, 2
1, 12	166	28, 72, 66	21, 83, 62	8, 145, 13
13, 24	96	25, 45, 26	18, 53, 25	5, 86, 5

NOTE.—Horizons are stated in calendar months, where event month 0 is the calendar month of the bankruptcy filing. Firms are classified as net buyers if the number of shares purchased exceeds the number of shares sold.

are able to separate only a subset (161 of 280) of our sample into these two groups. The data reveal a substantial difference in the returns to the securities of firms with positive equity and the returns to the firms with zero equity. The losses are greater for the latter group in each of the 4 years before filing. The cumulative measures are all larger (the losses are less) for the ''with equity'' firms. Later we show that insider selling is greater in the ''without equity'' subsample, indicating that insiders can and do discriminate between these two groups.

The empirical results reported in table 1 demonstrate that the securities of firms that file bankruptcy petitions suffer significant losses in the years preceding the filing date. This implies that insiders could avoid significant capital losses by selling their holdings before the firm's financial condition becomes generally known to the market. In the next section we examine whether or not they do.

B. Corporate Bankruptcies and Insider Trading

We group the insider trading data by firm, by calendar month, according to three classifications of inside traders: all, officers, and top executives. Top executives include presidents, chief executive officers, board chairs, officer-directors, chief financial officers, and controlling persons.[13] Officers include top executives plus all others with the word ''officer'' in their titles. All insiders include top executives, officers, and owners of more than 10% of the firm's outstanding shares. Table 2 summarizes our sample by reporting the number of firms classified

13. We include controlling persons with top executives for completeness. Our data set contains only 11 transactions by insiders with this designation. The profitability of trading by controlling persons exceeds the profitability of the rest of the top executives group.

as net sellers, net buyers, or nontraders for each of these classifications for 5 years before and 2 years after the filing date. The sixth row of the table reports the number of firms classified into each category over the 5 years preceding the filing month.

For the total sample of 324 firms over the 5 years before bankruptcy filing, all the insiders of 126 firms are net buyers, 38 do not trade, and 160 are net sellers.[14] Hence, sellers exceed buyers by 27%. For officers, there are 30% more sellers than buyers (158 minus 122 divided by 122), and for top executives, the number of sellers exceeds the number of buyers by 53% (107 minus 70 divided by 70). Moreover, the annual data show an increasing intensity of selling as the filing month approaches. For all insiders, in the third year before filing, net buyers outnumber net sellers. Two years before filing, there are more net sellers than net buyers, and in the year before filing, the ratio of sellers to buyers is almost 2 to 1. Similarly for officers, buyers exceed sellers 3 years before filing, while the excess of sellers over buyers in the year before filing is 63%. For top executives, the excess of buyers over sellers varies between 8% to 23% for all 5 years. Given the greater excess of sellers over buyers for the entire 5-year horizon, this suggests that top executive buying tends to occur in the same firms year after year while selling occurs in different firms in different points in time. Finally, as we reported earlier, insiders in small firms are on average net buyers, and not sellers. During 1975–92, in firms with $20 million or less in market value of equity, the ratio of firms with net selling to firms with net buying is 0.82, based on annual net shares traded. Hence, compared to this proper benchmark, there is significant selling by all classes of insiders.

Before proceeding, we pause to note the significantly smaller number of observations in the top executive category. More than 40% of the firms in our sample report no trades by top executives over the 7-year horizon. This may be the appropriate time to emphasize that our data consists of only *legal* insider trading of *equity* securities—insider trading that is reported to the government. Meulbroek (1992) provides evidence that the managers of some firms in financial distress, and even some that file formal bankruptcy petitions, sell their shares without reporting their trades to the SEC. If this is true more generally, then what we measure is a lower bound, perhaps an extreme lower bound, of the actual amount of insider trading prior to a bankruptcy filing. Of course, insiders must report only trades in the firm's equity. For example, they can trade straight debt without any regulatory constraints or reporting requirements.

14. The 38 nontrading firms are included in our tests because insiders in these firms reported some trading activity between 1975 and 1994, albeit outside our 7-year event period.

Finally, note the differences in the size of the samples across the various horizons. These differences are due to our convention of excluding firms that are not listed on NYSE, AMEX, or NASDAQ over the reported horizons. The number of observations decreases dramatically in the event month, as firms are delisted from the exchanges because of violations of financially based listing requirements. The drop in sample size is particularly acute for top executives. The postfiling data for this group is based on the trading of only 21 firms.

As discussed in the introduction, simply classifying a firm as a net seller or net buyer over a given period masks the important differences in the timing of the transactions, the size of the transactions, and their dollar values. Insiders may be sellers of stock before prices fall and buyers thereafter. They may sell before the news of financial distress becomes publicly known and buy or sell later if they believe the market has not fully adjusted to the information. In subsequent empirical tests we present evidence that is consistent with this characterization of insider trading in advance of a bankruptcy filing.

Our empirical analysis of insider trading follows the basic methodology of event studies. However, instead of returns, we analyze insider trading. For each observation we ''center'' the time series of insider trading around the filing date. We then measure the average trading per firm on each of the 85 event months from 5 years before to 2 years thereafter for each of the three categories. Figure 1 plots the cumulative values of insider trading for our three categories of insiders. In these and all subsequent data, sales are coded as negative numbers and purchases as positive numbers. Thus, a positive mean indicates that there was net buying during the period and a negative mean is an indication of net selling.

The data plotted in figure 1 reveal that there is a substantial amount of selling by insiders 5 years before filing a bankruptcy petition. By event month −48, insiders had sold a total of 25,000 shares per firm, representing a total disinvestment of $716,000 dollars per firm. Almost half of these net sales (12,000) can be attributed to top executives. Since the returns to the stockholders of these firms are significantly negative in the fourth year before filing (see table 1), the trading in the fifth year before filing suggests that insiders possess privileged information regarding the future price of their firms' securities.

In the fourth year before filing, insiders are net buyers, responding perhaps to the significant price decline in their firms' shares over this horizon. However, top executives are net sellers in this period. In fact, top executives are net sellers throughout the entire 7-year event window. The time series in figure 1 indicates that the selling transactions of top executives involve a greater number of shares than the buying transactions. The disparity between selling and buying for top executives is also reflected in the dollar value of their transactions. Over the

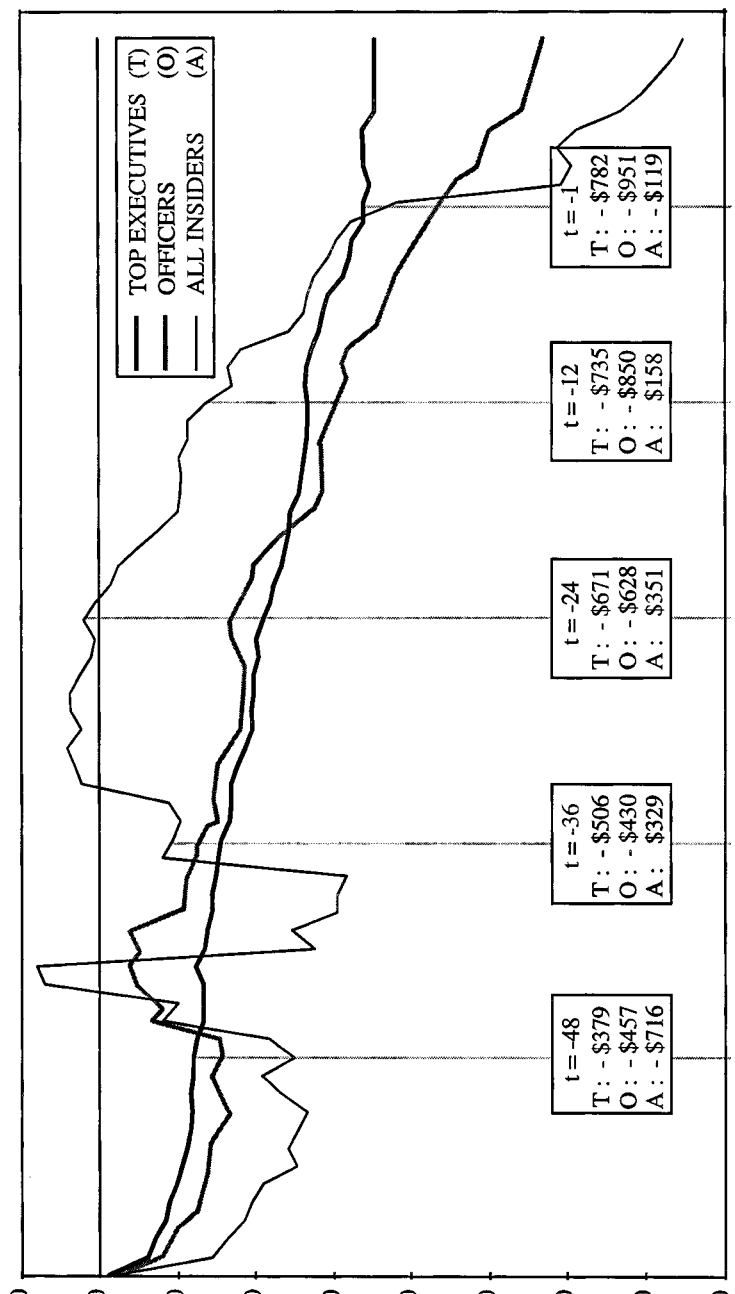

FIG. 1.—Net insider trading activity around bankruptcy filing months: cumulative net number of shares traded per firm by the insiders of firms filing bankruptcy petitions in 1975–92. Sales are coded as negative numbers and purchases as positive numbers, and cumulative net dollar trades per firm are reported in inserts in thousands of 1992 constant dollars.

entire 5-year period before filing, all insiders sold an average 38,000 shares per firm. The dollar value of their transactions is a net disinvestment of $119,000 per firm. Over the same period, top executives sold an average of 34,000 shares. However, the dollar value of their transactions average $782,000 per firm. These data indicate that insiders who are not officers or top executives are net buyers over the prefiling period. The significant buying of this group in the third and fourth years before filing more than offsets the significant selling in the second year before filing. The total dollars invested by all insiders from 5 years to 1 year before filing is a positive $158,000. The significant net dollar disinvestment by top executives indicates that they sell their shares before prices fall and buy after prices have fallen. The trading pattern and dollar values for the category of all officers reveal similar timing capabilities. Below we report additional evidence regarding the relation between the timing of insider trading and security returns.

In sum, the data reported in figure 1 indicate that insiders, particularly top executives and officers, are substantial sellers of their firms' shares prior to filing a bankruptcy petition. The time series of cumulative net trading shows a monotonic decline in the holdings throughout the entire 5-year prefiling period. Top executives reduce their holdings by more than $782,000 per firm. The figure is $951,000 for all officers. By any standard, these are economically significant numbers. The data also show that top executives have more information regarding the future price of their firms' shares. They are net sellers in every period. The trading by all officers reflect their superior information over other insiders. They are net buyers in only one of the 5 prefiling years.

In order to test the statistical significance of the insider sales documented above, we calculate a measure of ''abnormal'' trading for each firm in the sample. The measure is calculated as the difference in the actual trading activity for a given firm, over a certain period, and the amount of insider trading activity of a control portfolio over the same period. We construct three separate control portfolios—one each for top executives, officers, and all insiders. To construct our control portfolios, we calculate the mean annual equity value of all firms reporting any insider trading activity over the period 1975–92. In total, there are 11,378 such firms. We then rank all firms not in our bankruptcy sample according to total market equity and divide the sample into deciles. The insider trading activity over the entire period is then calculated for each size decile. Thus, for every calendar month between January 1975 and December 1992, we have 10 numbers representing the net insider trading activity of the firms in each of the size deciles for each classification of insiders—all, officers, and top executives. We use these 6,480 numbers (one for each of the three groups, 10 size deciles, and 216 calendar months) as our measure of a firm's ''expected'' trading activity for a given month. Our measure of abnormal trading is the difference

TABLE 3 Mean Monthly Abnormal Net Number of Shares Traded per Firm over the Indicated Horizon

Horizon	All Insiders	Officers	Top Executives
−60, −49	−623	−748	−648
	(−.88)	(−1.58)	(−2.07)
−48, −37	1,708	724	−2
	(.42)	(.80)	(.02)
−36, −25	1,234	109	−82
	(1.28)	(.41)	(−.68)
−24, −13	−730	−648	−261
	(−2.10)	(−2.54)	(−3.08)
−12, −1	−1,909	−819	−447
	(−3.55)	(−3.52)	(−3.36)
0	−19,667	−286	−421
	(−12.6)	(−.51)	(−.99)
1, 12	3,789	−955	45
	(.79)	(−2.50)	(.28)
13, 24	5,454	−395	136
	(1.50)	(−1.68)	(1.59)
−60, −1	−64	−276	−288
	(−.07)	(−1.18)	(−3.48)
−48, −1	76	−159	−198
	(.07)	(−.60)	(−3.24)
−36, −1	−468	−453	−263
	(−1.06)	(−2.83)	(−3.72)
−24, −1	−1,319	−734	−354
	(−3.86)	(−4.23)	(−4.37)
−6, −1	−1,637	−816	−684
	(−2.50)	(−3.53)	(−3.92)

NOTE.—Insider purchases are coded as positive numbers and insider sales as negative numbers. Insider trades have been adjusted by the amount traded by the insider of a portfolio of similarly sized firms over the same period. Horizons are stated in calendar months, where month 0 is the calendar month of the bankruptcy filing. Heteroscedastic-adjusted *t*-statistics are reported in parentheses.

between actual insider trading and the ''expected'' insider trading, as given by the mean trading activity of the appropriate group of insiders, of the firms in the appropriate size decile, in the appropriate calendar month.

Once we calculate the abnormal insider trading for each firm in calendar time, we average the measure cross-sectionally in event time and report averages for a given time period. Again, insider purchases are coded as positive numbers and insider sales as negative numbers.

The abnormal trading activity by insiders is presented in table 3. The mean monthly abnormal net number of shares traded are presented for various holding periods for the three insider groups. The upper part of the table reports annual numbers and the lower part reports cumulative numbers from 5 years before filing. The results show that there is significant insider selling in the 2 years preceding a bankruptcy filing. The *t*-statistics of the means for all three categories in each of the 2 years

preceding the filing date are less than −2.0. The mean estimates of the cumulative net trading for all insiders are significantly negative for up to 2 years before filing. For officers, the cumulative net trading estimates are significantly negative for up to 3 years before, and for top executives, the cumulative means are significantly negative for all five prefiling periods.

As a diagnostic check for the influence of outliers (extremely large trades), we reran the above analysis after recoding our entire database by changing all positive abnormal trading (the indicated group of the firm's insiders are net buyers for the given month) to +1 and all negative abnormal trading (the indicated group of the firm's insiders are net sellers for the given month) to −1. This transformation eliminates the effects of the magnitudes of the individual trades. Recall that the control adjusts for size, category of insider, and calendar month. We then ran time-series regressions of the abnormal trading for each group over our 7-year event window and entertained dummy variables to estimate the marginal effects for certain holding periods. For example, to estimate the average monthly marginal effect of insider trading in the 6 months prior to filing, we run a time-series regression from event month −60 through event month +24 and set a vector of dummy variables equal to 1 for observations −6 through −1 and zero for all other observations. Following this procedure we find that the estimates of the dummy variables are all negative for all three groups of insiders over the holding periods (−24, −13), (−12, −1), and (−6, −1). The estimated dummy variables and corresponding *t*-statistics (in parentheses) for ''all insiders'' are −.03 (−2.02), −.06 (−3.85), and −.05 (−3.91) for the three periods, respectively. For ''officers,'' the corresponding estimates and *t*-statistics are −.02 (−1.10), −.07 (−3.71), and −.07 (−4.44), and for ''top executives'' they are −.04, (−1.96), −.08 (−4.93), and −.08 (−3.21). These results demonstrate that selling intensifies in the periods just before filings irrespective of magnitudes. Thus, our conclusions regarding the significance of insider trading in advance of a bankruptcy filing are not based on a few extremely large trades.

In sum, our statistical analysis confirms the impression given by the cumulative trading patterns illustrated in figure 1. Insiders are significant net sellers of their firm's shares in the months and years preceding a bankruptcy filing. The amount of net selling is significant and economically material. We believe that the amounts involved are sufficient to have a significant effect on the incentives of corporate insiders to maximize shareholder value.

C. The Timing of Insider Trading and Stockholder Losses in Corporate Bankruptcies

We now examine the relation between the timing of insider trading and security returns directly. The data in table 1 indicate that the stockhold-

ers of bankrupt firms suffer significant capital losses in the years before filing. The data in table 3 indicate that insiders of these firms are significant net sellers of their firms' shares over this period. If insiders act strategically, we expect that the insider selling should occur before the stock price declines. If the insider selling occurs after the price declines, then they would not be avoiding the losses suffered by other shareholders. Hence, it is important to know exactly when the insider selling occurs.

To establish the timing of insiders' transactions, we partition abnormal holding period returns before and after insider trading using a dummy variable technique. We first calculate a series of nonoverlapping 3-month abnormal holding period returns from January 1975 through December 1992, data permitting. Firms with fewer than 10 data points are dropped from the analysis. Most of the firms in our sample are delisted on or before the filing date. For each 3-month holding period, we calculate the net abnormal trading by insiders in the 3 months preceding the holding period and the net abnormal trading by insiders in the 3 months after the holding period. In order to isolate the effects of ''large'' transactions and compare returns across firms, we scale the number of shares traded into three dummy variables: trades of 100 shares or less, trades of more than 100 and less than 1,000, and trades of 1,000 shares and more. Conceptually, our methodology is equivalent to running the following regression separately for each firm:

$$\text{abnormal holding period return}_t = \text{constant} + \alpha\, DB_{i,t} + \beta\, DA_{i,t} + \varepsilon_t,\ i = 1, 3,$$

where $DB_{i,t}$ denotes a dummy variable that takes on a value 1 if insiders buy, 0 if there are no trades, and -1 if insiders sell a given amount i during the 3 months before the holding period, t. Similar, $DA_{i,t}$ denotes a dummy variable that takes on a value 1 if insiders buy, 0 if there are no trades, and -1 if insiders sell a given amount i during the 3 months after the holding period, t. We also estimate this relation using a 6-month holding period to establish more closely the timing of insiders' transactions.

If, on the one hand, insiders sell stock before prices fall, then α should be positive and significant. On the other hand, if insiders sell after prices fall, then β should be positive and significant. However, if insiders believe that the market price has fallen too much, which is to say that the market has overreacted to the negative news regarding the firm's financial condition, then insiders may be prompted to buy after the price declines. Such a pattern would yield a negative estimate for β.

In table 4 we report the cross-sectional averages of the time-series estimates for each firm.[15] We report data separately for all insiders,

15. While not reported, we estimate the same equations using actual returns instead of abnormal returns. The results are qualitatively the same.

TABLE 4 The Timing of Insider Trading

Group	Constant	Amount Traded before Holding Period			Amount Traded after Holding Period			R^2	Firms
		$T < 100$	$100 < T < 1{,}000$	$1{,}000 < T$	$T < 100$	$100 < T < 1{,}000$	$1{,}000 < T$		
A. 3-month holding period:									
All	−.036	.003	.049	.028	−.087	.021	−.020	.049	291
	(−7.22)	(.03)	(1.32)	(1.68)	(−.70)	(.52)	(−1.35)		
Officers	−.036	−.053	.014	.046	−.085	.016	−.020	.047	290
	(−7.39)	(−.64)	(.42)	(2.81)	(−.79)	(.40)	(−1.25)		
Top Executives	−.034	.070	.043	.075	−.253	−.002	−.021	.034	241
	(−8.12)	(.52)	(1.18)	(3.28)	(−1.37)	(−.04)	(−1.05)		
B. 6-month holding period:									
All	−.058	−.051	.037	.032	−.126	−.049	−.091	.093	231
	(−6.78)	(−.26)	(.45)	(1.07)	(−.64)	(−.58)	(−3.39)		
Officers	−.058	−.223	.027	.056	−.144	−.053	−.085	.098	229
	(−7.31)	(−1.15)	(.32)	(1.51)	(−.80)	(−.73)	(−3.20)		
Top Executives	−.050	.136	−.164	.034	−.240	−.093	−.071	.061	202
	(−5.60)	(.61)	(−2.28)	(.67)	(−1.09)	(−1.06)	(−2.81)		

NOTE.—Reported are the means of estimated coefficients from firm-by-firm regressions of actual holding period returns minus the holding period returns to the Center for Research in Security Prices (CRSP) equally weighted index on the net number of shares traded in the indicated interval before the holding period and the net number of shares traded in the indicated interval after the holding period. Results are reported for two nonoverlapping holding periods: 3 months and 6 months. Trades are coded as one of the three dummy variables according to the number of shares traded: fewer than 100, more than 100 and fewer than 1,000, and more than 1,000. Sales are coded as −1 and purchases are coded as +1. The *t*-statistics of the mean coefficients are based on cross-equation standard errors and are reported in parentheses. The reported R^2 is the mean of the adjusted R^2 across equations.

officers, and top executives. We report the 3-month holding period in the top of the table and the 6-month holding period in the bottom of the table. The mean of the estimates for the ''before holding period'' trades are reported first, and the mean of the estimates for the ''after holding period'' trades second. The *t*-statistics of these mean estimates are based on cross-equation standard errors.

The estimates in table 4 indicate that insiders do in fact trade strategically on privileged information. The estimate of the coefficient on the large pre-holding-period transactions is significantly positive for officers and top executives in the 3-month holding-period regressions. The *t*-statistics are 1.68, 2.81, and 3.28 for all insiders, officers, and top executives, respectively. All of the estimates using the 6-month holding periods are positive, but not different from zero at conventional significance levels. The estimate of the coefficient on the large post-holding-period transactions is significantly negative for all three groups. The estimates based on 3-month holding periods have *t*-statistics less than -1.0 and those based on 6-month holding periods are less than -2.8. In sum, the data indicate that insiders sell before price declines and buy after prices have fallen.

We note that the prereturns trading is more significant in the 3-month holding-period regressions and the postreturns trading is more significant in the 6-month regressions. This suggests that insiders sell within a 3-month window before the release of bad news and buy after prices have fallen, perhaps in response to an overreaction by the market regarding the firm's financial condition. Also, prohibitions of short-swing profits, defined as a round-trip transaction within 6 months, may prevent insiders from buying soon after the sale of their shares.

D. Insider Trading and the Resolution of Bankruptcy Filings

As a final test of the relation between insider trading and stock returns, we calculate the difference in the abnormal trading of the insiders of firms that end up with no equity and the trading of the insiders of firms that are liquidated or reorganized with a positive equity position. The purpose of this test is to determine whether insiders can forecast the ultimate value of their firm's equity and whether they trade on this information. In a recent paper, Betker (1995) points out that firms with greater CEO stock ownership have greater deviations from absolute priority in favor of shareholders on the resolution of bankruptcy. We would like to find out whether differences in managerial incentives occur simply because managers happen to own different levels of equity or whether managers actively buy and sell shares to exploit information regarding the ultimate value of their shares. Moreover, finding that insiders ''bail out'' of firms that are liquidated or reorganized with zero equity calls into question the incentives of the managers of these firms to act in the stockholders' interest throughout the bankruptcy process.

TABLE 5 **Mean Monthly Abnormal Net Number of Shares Traded by the Insiders of Firms with Zero Equity Minus the Net Number of Shares Traded by the Insiders of Firms with Positive Equity**

Horizon	All Insiders	Officers	Top Executives
−60, −49	1,532	1,232	585
	(4.31)	(3.20)	(2.21)
−48, −37	9,957	1,783	605
	(2.77)	(1.28)	(1.53)
−36, −25	237	675	641
	(.21)	(1.01)	(1.76)
−24, −13	−1,976	−1,361	112
	(−2.14)	(−1.66)	(.42)
−12, −1	−3,696	−2,028	−796
	(−1.97)	(−1.99)	(−1.90)
0	−26,598	1,602	1,381
	(−9.89)	(1.16)	(1.19)
1, 12	−2,277	−1,238	−62
	(−0.91)	(−.78)	(−.22)
13, 24	63	−887	374
	(.04)	(−.92)	(1.38)
−60, −1	1,211	60	230
	(1.15)	(.13)	(1.35)
−48, −1	1,130	−232	141
	(.86)	(−.42)	(.70)
−36, −1	−1,812	−904	−14
	(−2.17)	(−1.72)	(−.06)
−24, −1	−2,836	−1,694	−342
	(−2.70)	(−2.58)	(−1.29)
−6, −1	−593	−582	−813
	(−.54)	(−1.03)	(−1.72)

NOTE.—Insider purchases are coded as positive numbers and insider sales as negative numbers. Insider trades have been adjusted by the amount traded by the insider of a portfolio of similarly sized firms over the same period. Horizons are stated in calendar months, where month 0 is the calendar month of the bankruptcy filing. Heteroscedastic-adjusted *t*-statistics are reported in parentheses.

Our results show that insiders can anticipate the ultimate value of their firm's equity, and they do trade on this privileged information. The data in table 5 show that insider sales in the year before filing are also greater for firms that liquidate or reorganize with zero equity.[16] The *t*-statistics of the differences for all insiders are −2.14 for the 2 years before filing and −1.97 for the 1 year before. The *t*-statistics for officers over the two periods are −1.66 and −1.99, respectively. For insiders, the *t*-statistic for the difference in the year before filing is −1.90. Hence our results are consistent with the interpretation that the

16. Recall that we obtained information regarding the value of the firm's equity at the time the bankruptcy is resolved from the *Directory of Obsolete Securities*. Recall also that we show in table 1 that the stockholders of firms that end up with a zero equity position suffer substantially greater losses in the 5 years before filing than do the stockholders of firms with positive equity at the time the bankruptcy is resolved.

managers orchestrate part of the differences in their share ownership to take advantage of the anticipated, ultimate value of the equity.

E. The Effects of Regulatory Changes on the Insider Trading in Bankrupt Firms

In this section we examine the effects of the significant changes in the laws governing corporate bankruptcies and insider trading that took place within our sample period. The objective is to determine if these regulatory changes had any effect on either the timing or the magnitude of insiders' trades. Our sample of corporate bankruptcies spans two distinct regimes in the legal environment of corporate bankruptcy and insider trading. Bankruptcies filed between 1975 and 1979 were governed by the 1938 Chandler Act, while the 1980–92 filings were adjudicated under the provisions of the 1978 Bankruptcy Reform Act, which most believe to be more prodebtor than the earlier legislation. Comparing the insider trading activity under the two regimes will allow us to determine if, as suggested by Bradley and Rosenzweig (1992), insiders have more control over the bankruptcy process in the latter period and are therefore better able to sell their shares before the market becomes aware of their firm's financial crises.

The second major change in the legal environment spanned by our sample is the enactment of the Insider Trading Sanctions Act of 1984 and the Insider Trading and Securities Fraud Enforcement Act in 1988. The avowed purpose of this sequence of legislation was to reduce the amount of insider trading. Seyhun (1992) argues that these acts, together with subsequent litigation, defined a safe harbor for insider trading and, ironically, has led to more, not less, insider trading profits. According to Seyhun, the regulation that emerged in the late 1980s gave corporate insiders greater latitude to engage in trading, provided that the trades were sufficiently removed from big, ''informational'' events. In terms of the question at hand, Seyhun's thesis predicts that, in the latter period, there would be more insider trading well in advance of the filing, but there would be less insider trading ''just before'' a bankruptcy filing. If it is informational events that attract regulatory scrutiny, then we would expect to see insiders become more wary of trading just before filing a bankruptcy petition.

To save space, we will simply summarize our findings for the three relevant subperiods: 1975–79, 1980–84, and 1985–92. We find that total abnormal insider selling is more than three times greater in the 1980–84 period than in the 1975–79 period, and the amount of abnormal selling is more than six times greater in the 1985–92 period than in the first. The estimated mean abnormal returns increase monotonically from the earliest to the latest period. The results for officers are particularly striking. In the 1985–92 period, abnormal sales 1 year before bankruptcy are more than three times greater than in the 1980–

84 period and more than 10 times the abnormal amount sold in the 1975–79 period. Clearly, insiders have been significantly greater sellers since the passage of the Bankruptcy Reform Act.

While the increase in insider trading in the post-1984 period is consistent with Seyhun's analysis, the amount of insider trading in the month of filing documented in table 3 is surprising. One would expect that an event as dramatic as filing Chapter 11 would attract the scrutiny of the regulatory authorities and thus make insiders reluctant to trade. To the contrary, the data in table 3 show some amount of selling in the month of filing for all three categories of insiders. However, closer examination of the data provides the explanation. The month 0 trading reported in table 3 includes all trades in the calendar month of the filing date. However, if we redefine the time period and examine trades 30 days before the filing, regardless of calendar time, we find that most of the trading takes place after the bankruptcy filing. Indeed, in the 1985–92 period there are absolutely no trades by top executives in the 30 days preceding a Chapter 11 filing. Thus, in general, we find that insiders sell significantly more of their holdings in the post-1984 period and that these sales occur more than 30 days before a bankruptcy filing. In other words, since the 1984 legislation, top executives have reported literally no transactions in their firms' shares in the 30 days preceding a filing. This is strong evidence consistent with Seyhun's interpretation of the effect of the regulations of insider trading imposed in the mid-1980s.

F. Industry-Adjusted Insider Trading

We now return to an issue we raised in the introduction of the paper. Here, we redefine the research question and ask if the insiders of firms that file a bankruptcy petition sell more of their shares than the insiders of firms that are in financial difficulty but do not obtain court protection by filing Chapter 11. What is the effect of filing bankruptcy per se?

We seek to measure the difference between the insider trading in firms that are in financial distress and ultimately file a bankruptcy petition (our sample) and the insider trading in firms that are in financial distress but do not file for bankruptcy protection. To construct the latter control sample, we match each firm in our bankruptcy sample with a portfolio of firms of similar size during the event period that have the same four-digit SIC code. We first average the insider trading across the portfolio for each filing firm and then calculate the average of these portfolio averages.

Since the fate of firms in the same industry are often linked, we suspect that the firms in our industry-matched sample are experiencing financial difficulties as well and that the insiders of these firms are also net sellers. Consistent with this suspicion, we find that the mean abnormal holding period returns for the firms in the industry portfolios

TABLE 6 Mean Percentage Book Debt-to-Asset Ratios for Firms Filing Chapter 11 and a Portfolio of Control Firms Matched on Industry, Size, and Time Period

Year	No. of Firms	Filing Firms	Control Firms	Difference	*t*-Statistic
−5	191	36.68	30.94	5.75	2.82
−4	213	38.93	32.24	6.69	3.20
−3	229	41.60	34.10	8.11	3.69
−2	233	46.06	34.10	11.96	5.10
−1	244	53.03	36.68	16.35	5.45
0	243	63.94	37.13	26.81	7.41
1	158	40.95	39.09	1.86	.38

are significantly negative. From 4 years before the filing dates of their corresponding sample firms through 1 month thereafter, the mean abnormal holding period return for the control portfolios is −29.05% ($t = 4.05$); from 3 years before through 1 month after the corresponding filing dates, the mean return is −22.29% ($t = -3.83$); from 2 years before through 1 month after, the mean return is −14.85% ($t = -3.13$); and from one year before through 1 month after, the mean return is −7.57 ($t = -2.86$). The data indicate that the firms in the same industries as those of our sample of filing firms are also experiencing financial difficulties. We therefore expect that the insiders of these firms are also net sellers. Note that, while we expect that for a given firm insiders will sell more when they expect the firm's stock price to fall by 50% than when they expect the price to fall by 10%,[17] there is no reason to expect this relation to hold across firms. In other words, we do not expect that the insiders of a firm who believe that their firm's shares will fall by 50% will sell more of their holdings than the insiders of another firm who believe that their firm's shares will fall by 25%. All we can predict is that the insiders in both firms will be net sellers.

While the firms in our industry-matched portfolios suffer significant losses, they do not suffer as great a loss as those in our bankruptcy sample. This partially explains why these firms do not file for bankruptcy protection. Another reason is that the firms in our industry-matched portfolios are not as highly levered. In table 6 we report the mean book debt-to-asset ratios of the firms in our bankruptcy sample and the firms in our industry-matched portfolios from 4 years before filing to 1 year thereafter. In each year, firms in the bankruptcy sample have significantly greater debt than those in the matched portfolios. These data suggest an obvious conclusion: firms that do not have (as much) debt in their capital structure do not (as frequently) file Chapter

17. This prediction is consistent with the results reported in table 4.

TABLE 7 Mean Monthly Abnormal (Industry-Adjusted) Net Number of Shares Traded per Firm over the Indicated Horizon

Horizon	All Insiders	Officers	Top Executives
−60, −49	−284	−445	−34
	(−.37)	(−.92)	(−.36)
−48, −37	2,568	1,119	52
	(.47)	(.94)	(.32)
−36, −25	2,967	719	229
	(1.96)	(1.70)	(1.02)
−24, −13	−17	−623	184
	(−.03)	(−1.50)	(.73)
−12, −1	−29	−223	201
	(−.03)	(−.46)	(.55)
0	−18,709	1,107	1,417
	(−5.15)	(1.48)	(2.04)
1, 12	3,949	971	979
	(1.46)	(2.95)	(4.07)
13, 24	4,803	850	714
	(2.03)	(3.54)	(4.18)
−60, −1	1,041	109	127
	(.88)	(.35)	(1.25)
−48, −1	1,372	248	167
	(.93)	(.67)	(1.34)
−36, −1	974	−43	205
	(1.45)	(−.16)	(1.32)
−24, −1	−23	−423	192
	(−.04)	(−1.32)	(.87)
−6, −1	978	−52	34
	(.66)	(−.17)	(.12)

NOTE.—Insider purchases are coded as positive numbers and insider sales as negative numbers. Insider trades have been adjusted by the amount traded by the insider of a portfolio of similarly sized firms over the same four-digit Standard Industrial Classifications (SIC) industry over the same period. Horizons are stated in calendar months, where month 0 is the calendar month of the bankruptcy filing. Heteroscedastic-adjusted *t*-statistics are reported in parentheses.

11. Put differently, if some of the firms in the industry-matched portfolios had more debt in their capital structure, then they might have experienced a greater loss in equity value and might have filed for Chapter 11 protection as well.

In light of the results regarding the losses to the firms in our industry-matched sample and their relatively lower leverage ratios, we now turn to a comparison of the insider trading in these firms and the insider trading in our bankruptcy sample. The differences in the trading pattern of the insiders of our sample of bankrupt firms and the insiders of our control sample of competitors are reported in table 7. For the most part, there is no significant difference in the trading pattern of the insiders of the two groups. There is greater selling by the insiders and officers of filing firms in the 2 years before filing. However, the differences

are not statistically significant. The only entry in the table that indicates significant selling is for all insiders in the calendar month of filing. Taken together, our results imply that insider trading is related more to a declining stock price than to whether or not the firm files a formal bankruptcy petition.

The data in table 7 show that the insiders are net buyers of their stock in the years following a bankruptcy filing. For officers and top executives, there is significant abnormal buying in the month of filing (after the filing date) as well. There are at least two possible explanations for this result. First, our analysis of the returns to filing firms indicates that the market prices of these firms ''bottom out'' after the announcement of the bankruptcy filing. Presumably the prices of the firms' competitors' stock continue to fall, which prompts more insider selling. Second, it may be the case that the insiders of filing firms know well beforehand that they intend to file a bankruptcy petition, which will no doubt attract the attention of the firm's investors and, more important, the scrutiny of the SEC. Fear of prosecution may prevent the insiders of filing firms from selling their shares or, at the very least, prevent them from reporting their sales to the SEC.

V. Summary and Conclusions

In this article we document that corporate insiders engage in significant sales of their firms' stock in the months and even years preceding a bankruptcy filing and thereby avoid significant capital losses. We find that insider selling begins 5 years before the filing date and builds to a crescendo up to the announcement month. We also find that selling is more intense for top executives and officers. Finally, we show that insiders sell stock before prices fall and buy stock after prices have fallen.

From a methodological standpoint, the results in this article generate two implications. First, we show that insider trading does, in fact, convey important information regarding the future market price of a firm's equity. Second, we show that it is important to examine the insider trading pattern before major corporate events. Trading just prior to an event is a way that managers can easily undo the incentive effects of insider holdings. This possibility underscores the importance of restricted stock, bonuses, phantom stock, and stock options, that is, inalienable securities, in aligning the interests of managers and stockholders.

Our results also raise possible questions regarding managers' incentives to maximize shareholder value throughout the bankruptcy process. Although insider sales may be a perfectly legitimate means for corporate managers to mitigate their losses in the event of financial

distress, selling their shares prior to filing reduces their incentives to bargain for stockholders' interests in Chapter 11 proceedings.

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