Gaining through Corporate Bankruptcy: Evidence from Competitors

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ABSTRACT

We investigate the competitive effects of financial distress on a filing firm's rivals. Using a sample of 219 Chapter 11 filings during the period 1980 to 2009, we find that irrespective of industry concentration, rival firms incur negative stock price effects when the news of the distress first becomes apparent. In contrast, rivals operating in concentrated industry gain significantly around the actual Chapter 11 filing. Gains vary significantly with the nature of the distress of the filing firm. Rivals gain more when the filing is purely economically distressed and is therefore less likely to survive after bankruptcy. Rivals subsequently experience realized cost reductions as evidenced by decreased SGandA expenses and higher margins in the year following their rival's bankruptcy filing. However, only the changes in operating characteristics of rivals in concentrated industries are associated with the gains due to the potential elimination of the filing firm.

JEL Classifications: G30, G33

Keywords: chapter 11; bankruptcy; financial distress; contagion effect; competitive effect

I. INTRODUCTION

In this study, we examine the effect of corporate bankruptcy on a rival firm's equity. Corporate bankruptcy has many effects on its various stakeholders such as its bondholders, stockholders, employees and its industry i.e. its competitors. In general, bankruptcy conveys negative news about the filing firm and therefore, adverse effects are expected on the various groups. An exception however may arise in the case of a bankrupt firm's competitor since the peer firm may benefit due to increased market share from the potential removal of the distressed firm. On the other hand, sources of cash flow in industry rivals are likely to be correlated and therefore, corporate bankruptcy may convey bad news about the filing firm's peers as well. Even without actually conveying new information about the industry, the anticipation of related bad news due to the bankruptcy may lead peer firms to suffer from contagion (Lang and Stulz, 1992).

An interesting question in this area is: when does a firm gain from a rival's bankruptcy and when does it lose? Lang and Stulz (1992), who examine the effect on the equity of the filing firms' rivals, posit that the competitive effects are likely to arise when firms operate in concentrated industries and a rival is relatively less levered and therefore, in a stronger financial position to take advantage of the market share increase. In contrast, firms operating in competitive industries do not have much scope for market share gains and are more likely to be affected negatively. Lang and Stulz find corroborating evidence in their study of 59 bankruptcies between 1970 and 1989. They found evidence of competitive effects for those rivals which had lower leverage and operated in concentrated industries, though these effects were smaller than observed contagion effects. However, subsequent research has not been able to provide direct evidence about the existence of such competitive effects. In a study similar to that of Lang and Stulz, but using an expanded sample, Ferris, Jayaraman, and Makhija (1993) were not able to find any significant competitive effects. They concluded that it was likely that news about the bankruptcy was already incorporated into market prices at the time of filing. Other studies find indirect evidence of competitive effects. Jorion and Zhang (2007) study jumps in the prices of CD swaps to investigate competitive and contagion effect in both Chapter 7 and Chapter 11 bankruptcies. They find that competitive effects are relatively more evident in their Chapter 7 sample. Intuitively, these firms are filing with the aim of liquidation, and not in order to restructure, and therefore, rivals' probability of gain is higher. Filing for Chapter 11 may weaken a firm and therefore, benefit the rivals. On the other hand, a filing firm may reemerge with lower leverage and less contractual obligations. Zhang (2010) examines this question and finds that when rivals emerge from the Chapter 11 process, firm experience significantly negative competitive effects (-6%) over 200 days following the emergence date.

Conceptually, a rival stands to gain the most market share only if the bankrupt rival is completely eliminated from the market. Therefore, from an intuitive standpoint, the ex-ante probability that a filing firm emerges successfully from the Chapter 11 process and remains a rival in the long run ought to play a major role in determining the wealth effects on rivals at the time of filing. In this study, we examine this issue in a sample of 219 Chapter 11 filings which took place between 1980 and 2009 by accounting for various factors which directly affect the probability of successful reorganization of a filing firm. We start by using Lemmon, Ma, and Tashjian's (2009) classification scheme for Chapter 11 filings by distress type: financial versus economically distressed. Lemmon

et al. (2009) show that one of the main determinants of the outcome of the Chapter 11 process is the type of distress faced by the filing firm. Financially distressed firms are those that have borrowed too much but are not faltering in terms of underlying operating performance whereas economically distressed firms have very poor operating performance and therefore, have difficulty repaying even low levels of debt. Lemmon et al. (2009) show that a financially distressed filing firm has a higher probability of emerging as a standalone entity from the Chapter 11 process compared to an economically distressed firm. Overall, when an economically distressed firm files for bankruptcy, competitors are likely to have more scope for gains. In contrast, a financially distressed firm is likely to emerge with less debt and remain a viable competitor. Therefore, when a financially distressed firm files for Chapter 11, the potential for gain to rivals will be lower.

Next, we consider the effects of industry concentration. Lang and Stulz (1992) showed that competitive effects arise in more concentrated industries which allows rivals larger marginal gains in market share at the expense of their bankrupt peer. Using distress type and industry concentration, we find that rivals to economically distressed filing firms in concentrated industries experience 2.62% (significant at the 1% level) abnormal equity returns around the 10 days of filing. This increases to over 5% (significant at the 1% level) when we account for the state of distress of the entire industry.

Next we turn to addressing the question of when the effect on the stock of rivals is likely to be most pronounced. From a competitor's perspective, financial distress in a rival leads to negative stock effects, but the potential to gain from enlarged market share will not arise until the distressed rival actually files for bankruptcy. However, few, if any, Chapter 11 filings are surprises as most firms try to avoid bankruptcy by restructuring their assets and liabilities. It follows that the act of filing Chapter 11 is unlikely lead to any new information about the distress of the filing firm. Since the market already knows about the distress, the rivals would not lose due to contagion effects but may gain because Chapter 11 may lead to a collapse of the rival leading to enlarged market share. The event of filing itself night be positive for the filing firm's rivals. To disentangle the differential effects of distress versus filing, we study equity effects on two dates for each bankruptcy filing: the filing date itself and a distress date. To identify the distress date, we follow the method described in Kolay, Lemmon, and Tashjian (2016) which aims to identify the distress date as that date in the pre-filing year when news of a firm's financial distress first arrives in the market. We conduct event studies on both sets of dates and we find that rivals of economically distressed filing firms operating in concentrated industries experience CAR equaling -1.96% (significant at the 1% level) in the 10 days around the distress date compared to the +2.62% (significant at the 1% level) we found for the same subset of firms during the 10 days surrounding the filing date. As expected, industry concentration plays a large role in determining the existence of competitive effects. We find that firms in competitive industries experience a uniformly negative contagion effect both around filing and around the distress date. The severity is greater in the 10-day distress period (-1.54% significant at the 1% level) than the filing period (-1.00% significant at the 1% level). Regressions confirm that all our findings hold in multivariate settings.

If competitive effects on peer groups are material enough, these should be reflected in changes in their operating performance during the period around filing. To test this, we examine changes in rival portfolios' excess operating performance around

the year of filing. We find that between the pre-filing year and the year of filing, irrespective of industry concentration, rivals experience declines in SGandA which are positively correlated to the degree of economic distress in the concentrated subsample. This implies that firms in concentrated industries gain from a lower SGandA when the likelihood of emergence of a rival declines.

Overall we contribute to the existing bankruptcy literature by showing that competitive effects of bankruptcy arise from the event of rival filing, and not necessarily due to the distress of the rival filing firms. Such competitive gains, which depend on the likelihood of the rival emerging successfully and on industry concentration, are stronger compared to what has been documented in the literature. We also show that even firms in concentrated industries experience contagion effects when the news of the rival's distress first arrives in the market. On the other hand, firms operating in competitive industries stand to lose both during the distress- and the filing- period. Further, we find that rivals operating in concentrated industries lower costs during the period of filing and these changes are higher if the rival is economically distressed. The paper is organized as follows. Section II describes the sample in detail including the choice of announcement date. In Section III, we present the results of the univariate and multivariate analysis of the different announcement effects on rivals. Section IV describes the results of the analysis of realized operating performance for rivals following the announcement. Section V concludes.

II.   SAMPLE DESCRIPTION AND ANNOUNCEMENT DATES

We start with the LoPucki Bankruptcy Research Database for our initial sample of 869 Chapter 11 filings between 1980 and 2009. Each of these firms possesses assets of at least $100 million (in 1980 dollars) at the time of filing and has at least one publicly traded security.[1] We ensure that each filing firm has enough historical data to calculate the main variable of interest which is the degree of economic distress and has an identifiable distress date.

To classify firm by their distress type and level, we follow Lemmon, Ma, and Tashjian (2009) and perform in-sample sorts of the sample of bankrupt firms into deciles (zero being smallest and nine being largest) on the basis of both their industry-adjusted EBITDA-to-assets as well as leverage. Both individual rankings are then added resulting in a proxy for the degree of economic versus financial distress, ranging from 0 to 18. The industry adjustment for EBITA/Assets is done by subtracting the industry median EBITDA-to-total assets from the sample firm's EBITDA-to-total assets. Industry medians are calculated based on 4-digit SIC codes provided that there are five or more firms in the industry, excluding the sample firm. Leverage is calculated as the ratio of total liabilities to total assets averaged over two years prior to the year of filing. Following Lemmon et al. (2009), we label firms in categories 0 to 5 as economically distressed, firms in categories 14 to 18 as financially distressed, and the remaining firms as having mixed type of distress. In addition to distress type, the filing firm's RandD expenditure-to-asset ratio, RandD intensity, is used as a measure of product specialization. Industry concentrations is measured using the Herfindahl index of all the firms having the same 4-digit SIC code as the filing firm.

To identify distress date for each bankrupt firm, we follow Kolay et al (2016) and search for news articles in Lexis Nexis over one year prior to the filing date for each firm.

We rank order the articles based on the kind (and severity) of news e.g. resultant trading partner's distress and failed restructuring efforts are considered more serious than an initial attempt at restructuring (see Kolay et al. (2016) for a detailed discussion) and choose the date on which first such negative information arrived to the market. We also use an industry distress indicator variable which is similar to that used in Acharya, Bharath, and Srinivasan (2007), Lemmon et al. (2009) and Kolay (2016). We compute the industry median (based on 4-digit SIC code) stock return for the 12 months immediately prior to the Chapter 11 filing. If there are less than five firms in that 4-digit SIC code, we use the 3-digit (or, if required, 2-digit) SIC code to calculate the industry median. Industries with median return lower than -30% are identified as distressed with an indicator variable equal to one if distressed and zero otherwise.

In terms of regulatory regimes, the sample period is constructed such that it mostly lies in between the two most recent major regulatory changes to the laws governing corporate bankruptcy practices: the Bankruptcy Reform Act of 1978 and, more recently, the Bankruptcy Reform Act of 2005 (BAPCPA) (Hotchkiss, Kose, Mooradian, and Thorburn, 2008). While the Bankruptcy Reform Act of 1978 established most of the current corporate bankruptcy procedures, the BAPCPA, which became effective in October 2005, led to several major changes to the existing system, specifically with regards to deadlines for bankruptcy plan filings, disclosure statements and for plan confirmation.[2] Empirical research in this area shows that as Chapter 11 case law evolves, characteristics such as absolute priority rule violations, debtor-in-possession financing, management turnover, and time spent in Chapter 11 change over time as well (Bharath, Panchapagesan, and Werner, 2008). For instance, anecdotal evidence suggests that post-BAPCPA, bankrupt retailers may have been adversely affected, as the time period allowed to the debtors to assume or reject leases has been effectively reduced under the new regulation.[3] Since the aim of this study is to assess competitive effects, regulatory changes, especially those that might affect any single subgroup more than others, may lead to confounding effects and therefore, in general, we aim to avoid these.

However, at the same time, one of the aims of this study is also to assess what role, if any, industry distress (industries with returns less than -30%) plays in the generation of competitive or contagion effects. Therefore, we balance both these requirements by extending our sample period to the post-BAPCPA period to include the most recent recession of 2008-2009 but truncate the sample at 2009, so that the effects of changes induced by BAPCPA are relatively lower.[4] Further, since this study relies on manually collected data about the arrival of news into the market during the pre-filing year, fewer bankruptcies in any given year make it less cost-effective to collect data. While the number of filing firms in 2009 spiked to 91, it dropped sharply to 36 in 2010. For the next five years, the number of filing firms per year remained below 30.[5]

Overall, our sample period covers a twenty-nine year period which includes the major recessions of 2000-2001 (the dot come bust) as well as that of 2008-2009, while simultaneously attempting to minimize any potential confounding effects on our results due to major legal changes.

After ensuring that enough data is available for the identification of distress dates and calculation of industry distress indicator as well as the degree of economic distress of the filing firm, we are left with 219 bankruptcy events. Table 1 shows the yearly distribution of the bankruptcies along with the rival distributions. A rival firm is identified as a firm which operates in the same 4-digit SIC code as the filing firm in the

filing year. The average bankrupt firm has about 2 billion in assets and each year, the filings are spread out over 4 different industries. The average number of rivals (firms in the same 4-digit SIC as the filing firm) is 31 for each filing firm. We create equal weighted portfolios of industry rivals of the filing firm. Using market share weighted portfolios of industry rivals leads to qualitatively similar results.

Table 1

Distribution of firms filing chapter 11 and rival portfolios

This table describes the distribution of the final sample of firms filing for Chapter 11 bankruptcies by year. The sample period is from 1980 to 2009 and includes 225 events. Column 2 reports the number of firms filing each year while Column 3 provides information about industry coverage in terms of four-digit SIC code. Column 4 presents the average book value of total assets in millions of the filing firm. Columns 5-7 present information about the mean, minimum and maximum number of rivals included in equal weighted industry portfolios for each filing event. * denotes in millions.

Year of Chapter 11 filing	Frequency	Average of total assets*	Number of industries	Mean number of rival firms	Min number of rival firms	Max number of rival firms
1980	1	625	1	1	1	1
1981	1	1,432	1	5	5	5
1982	5	413	4	68	1	291
1983	2	580	2	33	30	35
1984	3	1,021	3	108	21	272
1985	2	770	2	8	7	8
1986	3	2,654	2	87	19	222
1987	4	9,689	3	12	1	33
1988	2	828	2	17	13	21
1989	6	2,214	3	22	14	28
1990	11	986	6	30	3	193
1991	10	1,611	6	16	1	41
1992	5	1,453	5	40	2	175
1993	8	699	7	14	4	30
1994	2	1,082	2	10	7	13
1995	5	596	3	20	2	33
1996	6	848	4	13	2	31
1997	4	535	3	7	5	8
1998	6	433	6	65	14	185
1999	12	738	8	36	3	175
2000	18	1,431	7	54	3	440
2001	22	3,037	7	67	2	209
2002	26	5,899	10	41	2	176
2003	15	1,131	7	23	1	87
2004	8	1,179	5	12	1	33
2005	10	8,476	4	17	1	31
2006	2	5,744	1	25	25	25
2007	2	370	2	22	15	28
2008	6	1,633	5	10	2	24
2009	12	20,148	9	42	1	155
Full sample	219	2,609	4	31	7	100

Table 2
Descriptive statistics of main variables

This table provides descriptive statistics for cross-sectional variables (N = 219). Rival firm leverage is calculated as the average of the rival's total liabilities-to-total assets at year -1 and -2 relative to filing. Filing firm RandD intensity is RandD expenses/total assets for each bankrupt firm calculated as average of RandD expenses-to-total assets at year -1 and -2 relative to filing. Industry concentration is the Herfindahl index calculated for each filing firm using all the firms in the same 4 digit SIC code. The degree of economic (v. financial distress) is proxied for each firm by summing the deciles obtained by performing in-sample sorts of the sample of bankrupt firms into deciles (zero being smallest and nine being largest) on the basis of both industry-adjusted EBITDA-to-assets and leverage. Industry adjustment is done by subtracting the industry median EBITDA-to-total assets from the sample firm's EBITDA-to-total assets. Leverage is calculated as the ratio of total liabilities to total assets averaged over two years prior to the year of filing. The proxy ranges from 0 to 18, 0-5 being economically distressed, 14-18 being financially distressed, and the remaining being mixed type of distress. Industry distress is an indicator variable that equals one if stock return of the median firm in the filing firm's industry is less than -30% in the 12 months immediately prior to Chapter 11 filing. Filing firm size is the log of the book value of total assets of the filing firm averaged at year -1 and -2 relative to filing. Prepackaged filing is a dummy variable that equals one if the firm's Chapter 11 is a prepackaged bankruptcy, and zero otherwise. Panel A reports the summary statistics for the main variables, and Panel B presents the Pearson correlation coefficients. In Panel B, p-values are presented in parentheses.

Panel A: Summary statistics of main variables

Variable	N	Mean	Median
Filing firm degree of economic distress	219	9.28	9.00
Rival firm leverage	219	0.78	0.69
Filing firm size	219	7.86	7.01
Industry concentration	219	0.23	0.17
Filing firm RandD intensity	219	0.01	0.00
Industry distress	219	0.31	0.00
Prepackaged filing	219	0.26	0.00

Panel B: Correlation table

	Filing firm degree of economic distress	Rival firm leverage	Filing firm size	Industry concen-tration	Filing firm RandD intensity	Industry distress
Rival firm leverage	0.1234					
	(0.066)					
Filing firm size	0.1195	0.0265				
	(0.074)	(0.694)				
Industry concentration	0.1331	-0.0462	-0.0823			
	(0.047)	(0.492)	(0.220)			
Filing firm RandD intensity	-0.0698	-0.0376	-0.0183	0.1007		
	(0.297)	(0.577)	(0.784)	(0.133)		
Industry distress	-0.0417	0.0047	0.0864	-0.0346	0.1333	
	(0.534)	(0.945)	(0.197)	(0.607)	(0.046)	
Prepackaged filing	0.1662	0.1480	0.0043	0.1118	-0.0546	-0.0394
	(0.013)	(0.027)	(0.950)	(0.095)	(0.415)	(0.557)

Panel A of Table 2 presents the key statistics of the main variables while panel B presents the correlation matrix between the main variables. By construction, the degree of economic distress is correlated with leverage and profits of both the filing firm as well as the rivals (due to industry adjustment). All data used for calculations are averaged values from years -3 and -2 relative to the filing year for both filing firms as well as rival firms. Variables relating to rivals are means and medians of the values found using equal weighted portfolios. The average filing firm suffers from mixed distress (median value of degree of economic distress is 9.00) while 31% of the filing firms operate in distressed industries.

III.   DETERMINANTS OF ABNORMAL RETURNS TO RIVALS

A.   Distress and Filing Announcement Abnormal Returns to Rivals

Table 3 presents abnormal returns over various event windows using the market-adjusted returns method (Brown and Warner, 1985), which is the daily abnormal return calculated as the firm-specific return minus the CRSP value-weighted market return. The average rival return is the simple average of equal weighted portfolios of all firms in Compustat operating in the same 4-digit SIC code returns. The portfolios are grouped into subsamples by industry concentration (above and below sample average Herfindahl Index 0.22). Firms operating in highly concentrated industries are further subdivided by degree of economic distress and industry distress. A high degree of economic distress indicates a firm with below sample average mean of degree of economic distress (9.28). A firm (and its rivals) are considered to be operating within a distressed industry if the industry median (based on 4-digit SIC code) stock return for the 12 months immediately prior to the Chapter 11 filing is less than -30%. [6]

Table 3
Industry abnormal equity returns around a firm's filing and distress events

The table contains average filing-period and distress-period rival cumulative abnormal portfolio returns. . A rival portfolio is an equal-weighted portfolio of all other Compustat firms in the same four-digit SIC code for which equity returns are available. The market return is proxied by the CRSP value-weighted equity index. The distress day is the first date with major news of financial distress in the 12 months prior to filing. Industry concentration is the Herfindahl index calculated for each filing firm or supplier firm using all the firms in the same 4 digit SIC code. High (low) concentration indicates that the industry has above (below) sample average industry concentration. The degree of economic (v. financial distress) is proxied using a measure that is constructed similarly to Lemmon et al. (2009) by 1) averaging the firm's industry-adjusted EBITDA-to-assets and ranking this into deciles among all Chapter 11 sample firms, 2) leverage and ranking this into deciles among all Chapter 11 sample firms, and 3) summing these two decile rankings. The degree of economic distress takes on values from 0 to 18, with high values having a higher degree of financial distress and low values having a higher degree of economic distress. A high degree of economic distress indicates a firm with below sample average mean of degree of economic distress. Industry distress is an indicator variable that equals one if stock return of the median firm in the filing firm's industry is less than -30% in the 12 months immediately prior to Chapter 11 filing. Panel A presents results for the filing-day period while Panel B presents results for the distress-day period. Standard errors are computed as described in Patell (1976). ***, **, or * indicates that the average is significantly different from zero (using a two-sided t-test) at the 1%, 5%, or 10% level, respectively.

Panel A: Rival average cumulative abnormal returns for filing announcement date

| | Rival Cumulative Abnormal Returns on Filing date | | | | |
	Full sample	High concentration	Low concentration	High concentration /High degree of economic distress	High concentration /High degree of economic distress/Industry distressed
[-1,1]	0.43%	0.84%[*]	-0.63%[***]	1.99%[***]	4.99%[***]
[-2,2]	0.59%	1.10%[**]	-0.61%[***]	2.38%[***]	6.36%[***]
[-5,5]	0.71%	1.36%[**]	-1.00%[***]	2.62%[***]	5.23%[**]
# of portfolios	219	140	79	74	20

Panel B: Rival average cumulative abnormal returns for distress announcement date

| | Rival Cumulative Abnormal Returns on Event date | | | | |
	Full sample	High concentration	Low concentration	High concentration /High degree of economic distress	High concentration /High degree of economic distress/Industry distressed
[-1,1]	-0.84%[***]	-0.63%[***]	-1.14%[***]	-1.02%[***]	-2.07%[***]
[-2,2]	-0.83%[***]	-0.35%	-1.41%[***]	-0.92%[***]	-1.15%
[-5,5]	-1.35%[***]	-1.04%[*]	-1.54%[***]	-1.96%[***]	-4.28%[***]
# of portfolios	219	140	79	74	20

Panel A of Table 3 presents the results for the filing date. All portfolios of rivals to filing firms operating in concentrated industries experience significant positive abnormal returns over the 3-day whereas rivals to filing firms operating in competitive industries experience significant negative abnormal returns over all three event windows. Looking at the competitive effects experienced by the concentrated industries, we find that abnormal returns increase in magnitude and significance if the filing firm is economically distressed and operates in a concentrated industry (2.38% over the 5-day window, significant at the 1% level). This provides evidence to support the notion that competitors stand to gain more when the probability that the filing firm will not emerge is high. That the bankruptcy filing of a competitor may benefit rivals is further shown by the abnormal CAR even when the industry distressed over the 5-day window, we find that the CAR for rival portfolios is an economically significant 6.36% (significant at the 1% level) when the industry is concentrated and distressed while the filing firm is economically distressed. Thus, in a distressed industry with few competitors (high concentration), rivals may stand to gain more than losses due to extra information released to the market at the time of filing, especially if the entire industry is distressed.

Panel B presents the results for the distress date and provides further evidence that the positive returns experienced by the rivals on the filing date are due to competitive effects. Contagion effects occurring due to information about the rival firm's distress would have already happened since the information is already available in the market at the time of filing. This is evidenced from the uniform negative abnormal returns around all the event windows surrounding the distress date. Rivals operating in competitive industries lose more than those in concentrated industries (-1.41% significant at the 1% level versus -0.35% insignificant over the 5-day window). However, when the subsample of economically distressed filing firms operating in concentrated industries is considered, the effects are more severe, over the 5-day window, rivals to economically distressed

filing firms operating in concentrated industries experience -0.92% abnormal equity returns (significant at the 1% level). When broken into a further subsample based on industry distress, the point estimates increase in magnitude but the 5-day abnormal returns are not statistically significant though the 3-day and the 11-day are significant at the 1% level. The distress date is, by construction, one in which new and unambiguous information is available to the market about the filing firm's distress. Therefore, on this date, we observe clear contagion effects. Competitive effects are not seen on the distress date since such effects arise from the potential elimination of the competing firm and while current distress might lead to future elimination, it is not sure that it will.

B.   Multivariate Analysis of Distress and Filing Announcement Abnormal Returns to Rivals

Table 4 presents the results from the multivariate regression using the equal weighted rival portfolio returns around the 5-day period surrounding the filing date as the dependent variable. Column 1 presents the results from using the full sample of firms. In the preceding analysis of abnormal returns, firms operating in competitive industries experienced significant negative abnormal returns due to the information effect while those in concentrated industries experienced significant positive abnormal returns due to competitive gains from the potential elimination of a rival. Therefore, within the full sample of firms, some firms are expected to gain while others stand to lose. This is in accordance with the overall lack of explanatory power and the lack of significance in the results in Column 1.

In Column 2, we consider the subsample of firms operating in concentrated industries only. We find that the degree of economic distress is strongly negatively associated with the rival portfolio returns. As the filing firm's moves from being purely economically distressed to purely financially distressed, the rival portfolios experience more negative abnormal returns. The degree of distress variable alone explains about 5.9% of the variation in the rival portfolio returns around the filing date. In Column 3, where all the other explanatory variables are also included, the coefficient remains virtually unchanged, both in size and in significance. The only other variable significant is the RandD intensity of the filing firm. Rivals stand to lose more if the filing rival had a large amount of RandD expenditure. This is expected since higher RandD expenses would imply that product specificity is important for the industry. Therefore, the filing might convey new information about the industry.[7]

In Column 4, the subsample of only those rival portfolios where the industry is distressed is included. The number of observations in this specification drops to 28. However, the degree of economic distress remains significant and the point estimate increases in magnitude. Rival firms stand to gain more from the potential elimination of a competitor when the entire industry is struggling. Filing firm size is also significantly negatively related to the abnormal equity returns realized by the rivals. This is in accordance with Aghion, Hart, and Moore, 1992 whereby the relatively larger level of financing requirements as well as higher asset fire sale costs, makes larger firms more difficult to acquire, sell or liquidate. The leverage of the filing firm's rivals is also negatively associated with the CAR. This is in agreement with Lang and Stulz (1992) finding that rivals of the filing firm with higher leverage suffer greater contagion effects. The effect of the filing firm's distress on its rivals is likely to be amplified in the presence of higher debt levels in the rival's own capital structure.

Table 4

Cross-sectional analysis of industry rival's CAR around filing date

This table presents the coefficient estimates of cross-sectional regressions for the rival portfolio's abnormal returns around the filing date. The dependent variable is the CAR for the industry portfolio from a MAR model for the [−2, +2] daily interval, where Day 0 is the firm filing date. Rival firm leverage is calculated as the average of the rival's total liabilities-to-total assets at year -1 and -2 relative to filing. Filing firm RandD intensity is RandD expenses/total assets for each bankrupt firm calculated as average of RandD expenses-to-total assets at year -1 and -2 relative to filing. Industry concentration is the Herfindahl index calculated for each filing firm using all the firms in the same 4 digit SIC code. The degree of economic (v. financial distress) is proxied using the measure described in Table 2. Industry distress is an indicator variable that equals one if stock return of the median firm in the filing firm's industry is less than -30% in the 12 months immediately prior to Chapter 11 filing. Filing firm size is the log of the book value of total assets of the filing firm averaged at year -1 and -2 relative to filing. Prepackaged filing is a dummy variable that equals one if the firm's Chapter 11 is a prepackaged bankruptcy, and zero otherwise. Model 1 includes the full sample for which data is available while Models 2—5 present results for subsample of filing firm rivals for whom the industry concentration is above the sample median. Model 6 presents results from using the subsample with below median industry concentration. The t-statistics are presented in parentheses are heteroscedasticity-robust.

Dependent Variable	CAR over (-2, +2) for rival portfolios of filing firms over filing period					
	Full sample (1)	Above median industry concentration (2)	Above median industry concentration (3)	Above median industry concentration (4)	Above median industry concentration/ Industry distressed (5)	At or below median industry concentration (6)
Intercept	0.044 $(2.15)^{**}$	0.045 $(3.09)^{***}$	0.094 $(3.00)^{***}$	0.224 $(4.63)^{***}$	0.342 $(3.25)^{***}$	0.013 (0.39)
Filing firm degree of econ. distress	-0.001 (-1.49)	-0.004 $(-3.08)^{***}$	-0.004 $(-2.94)^{***}$	-0.004 $(-2.63)^{***}$	-0.006 $(-2.57)^{**}$	0.001 (1.19)
Industry distress	0.012 (1.43)		0.018 (1.31)	0.023 (0.21)		0.008 (0.82)
Filing firm size	-0.006 $(-2.02)^{*}$		-0.006 (-1.4)	-0.015 $(-3.87)^{***}$	-0.027 $(-2.41)^{**}$	-0.005 (-1.34)
Rival firm leverage	-0.004 (-0.84)		-0.010 (-1.56)	-0.006 (-0.97)	-0.143 $(-2.18)^{**}$	0.006 (0.98)
Filing firm RandD intensity	-0.088 (-0.81)		-0.240 $(-2.47)^{**}$	-0.159 (-1.23)	-0.849 (-1.49)	-0.067 (-0.35)
Industry concentration	0.017 (0.88)		-0.012 (-0.42)	-0.053 (-1.62)	0.060 (0.63)	-0.025 (-0.22)
Prepackaged filing	0.010 (1.39)		0.002 (0.18)	-0.010 (-0.69)	0.013 (0.59)	0.017 $(1.95)^{**}$
Year dummies	No	No	No	Yes	No	No
Industry dummies	No	No	No	Yes	No	No
# of observations	219	140	140	140	28	79
p-value of F statistic	0.120	0.006	0.048	0.114	0.043	0.265
Adjusted R-squared	0.021	0.059	0.068	0.120	0.273	0.018

Column 5 presents the results for the subsample of filing firms which operate in competitive industries. Apart from the indicator for prepackaged bankruptcies, none of the other explanatory variables are significant. Filings which use prepackaged bankruptcies are associated with a positive effect on the rival CAR. Rivals operating in competitive industries do not stand to gain much if the filing firm is eliminated. Therefore, a rival filing for a prepackaged bankruptcy might convey positive information to the market since empirical evidence (e.g., Tashjian et al (1996) show that prepackaged bankruptcies are associated with a higher likelihood of emerging as standalone firms from the Chapter 11 process). Overall, the abnormal returns of concentrated industries are driven by factors which are different from those driving the CARs of completive industries. While such differences in the drivers of CAR are evident when the samples are divided by the concentration, it is surprising that the concentration variable itself is not significant in any of the specifications.

Table 5 presents the results of the same multivariate regression as in Table 4 but using the CAR of the equal weighted rival portfolios in the 5-day period surrounding the distress date rather than the filing date. Column 1 includes only the filing firm's degree of economic distress as an explanatory variable for the full sample while Column 2 includes both filing firm's degree of economic distress as well as an indicator for industry distress. While the coefficient of the filing firm degree of economic distress is positive and marginally significant implying that the more (less) financially (economically) distressed the filing firm is, the more the CAR of the rival portfolio. Therefore, competitive effects are not in evidence during the distress period. Instead, strong information effects are evident as shown by the significant negative coefficient on the industry distress variable. During the distress period of the rival firm, information about the industry is released to the market. The negative and significant coefficient is present in Column 3 in which all explanatory variables are included. However, while the degree of economic distress variable remains marginally significant, none of the other variables are significant. Columns 4 and 5 present results for the subsamples in concentrated and competitive industries respectively. In the subsample of concentrated industries, neither industry distress nor the filing firm's degree of economic distress is significant though both coefficients retain the same sign as that in the specification using the full sample. In contrast, firms operating in competitive industries experience significantly lower CAR if their industry is also distressed. The filing firm's degree of economic distress remains only marginally significant in this subsample.

Taking the results from both the distress and the filing date into account, it is clear that firms which operate in concentrated industries derive significant gains in terms of stock returns, but only at the time of the Chapter 11 filing. When the first news of their rival's distress is released to the market, rivals experience significant negative abnormal returns. Therefore, rivals experience both positive and negative effects but the timing differs. Negative Information effects dominate during the distress period but the filing itself which might lead to the potential elimination of a rival is construed as a positive development. If the filing firm is economically rather than financially distressed, and consequently has lower probability of emergence, rivals in concentrated industries stand to gain relatively more.

Table 5
Cross-sectional analysis of industry rival's CAR around distress date
This table presents the coefficient estimates of cross-sectional regressions for the rival portfolio's abnormal returns around the distress date. The dependent variable is the CAR for the industry portfolio from a MAR model for the [−2, +2] daily interval, where Day 0 is the distress date. The distress day is the first date with major news of financial distress in the 12 months prior to filing. Additional details are in Section 3. Rival firm leverage is calculated as the average of the rival's total liabilities-to-total assets at year -1 and -2 relative to filing. Filing firm RandD intensity is RandD expenses/total assets for each bankrupt firm calculated as average of RandD expenses-to-total assets at year -1 and -2 relative to filing. Industry concentration is the Herfindahl index calculated for each filing firm using all the firms in the same 4 digit SIC code. The degree of economic (v. financial distress) is proxied using the measure described in Table 2. Industry distress is an indicator variable that equals one if stock return of the median firm in the filing firm's industry is less than -30% in the 12 months immediately prior to Chapter 11 filing. Filing firm size is the log of the book value of total assets of the filing firm averaged at year -1 and -2 relative to filing. Prepackaged filing is a dummy variable that equals one if the firm's Chapter 11 is a prepackaged bankruptcy, and zero otherwise. Models 1—3 use the full sample while models 4 and 5 use subsamples with industry concentration above (below) the sample median. The t-statistics are presented in parentheses are heteroscedasticity-robust.

Dependent Variable	CAR over (-2, +2) for rival portfolios of filing firms over distress period				
	Full sample (1)	Full sample (2)	Full sample (3)	Above median industry concentration (4)	Below median industry concentration (5)
Intercept	-0.018 $(-2.67)^{***}$	-0.011 (-1.59)	0.002 (0.12)	0.023 (0.81)	-0.006 (-0.20)
Filing firm degree of economic distress	0.001 $(1.80)^{*}$	0.001 $(1.67)^{*}$	0.001 $(1.81)^{*}$	0.001 (1.06)	0.002 $(1.91)^{*}$
Industry distress		-0.022 $(-2.95)^{***}$	-0.022 $(-2.98)^{***}$	-0.013 (-1.25)	-0.029 $(-2.67)^{***}$
Filing firm size			-0.003 (-1.26)	-0.003 (-0.77)	-0.002 (-0.65)
Rival firm leverage			0.007 (0.77)	0.006 (1.32)	0.010 (0.57)
Filing firm RandD intensity			0.084 (1.06)	0.154 $(3.52)^{***}$	-0.126 (-1.00)
Industry concentration			-0.009 (-0.46)	-0.047 (-1.60)	-0.105 (-0.99)
Prepackaged filing			-0.003 (-0.42)	-0.016 $(-1.91)^{*}$	0.010 (0.96)
# of observations	219	219	219	140	79
p-value of F statistic	0.128	0.003	0.011	0.191	0.023
Adjusted R-squared	0.006	0.044	0.038	0.028	0.085

IV.   ANALYSIS OF CHANGES IN OPERATING PERFORMANCE OF RIVALS AROUND FILING PERIOD

In this section, we examine changes in rivals' realized operating performance following the filing announcement to investigate whether rival bankruptcy results in changed sales, costs, or margins and whether such changes are related to the probability of successful emergence of the filing rival firm. We start by following Zhang (2010)'s approach to calculate the average measure of each operating performance measure using the entire universe of Compustat firms for that particular year. We then adjust each rival portfolio's operating measure by subtracting this Compustat-average operating measure. The bankrupt firms and their rivals are excluded when calculating the Compustat average. We follow this process and calculate adjusted operating metrics for both the pre-filing year (year before the filing) and the first post-filing year. Ultimately, we are able to find 220 Compustat-adjusted rival portfolios in the years prior to and after rival bankruptcy.

Table 6

Change in operating performance of rivals around filing year

This table presents the Compustat-adjusted measures of operating performance for rival portfolios to filing firms. Each value is a difference found by subtracting the variable value of the average of all firms in Compustat for that fiscal year. Year 0 is the fiscal year end following the bankruptcy filing while Year 1 is the pre-filing year. Operating profit margin is defined as EBITDA/Total Assets. Gross margin is defined as (Sales-COGS)/Sales. SGA is the Selling, General and Administration costs. Panel A presents results for the subsamples where the industry concentration is above the median sample value whereas Panel B presents the results for the subsample of firms with below median industry concentration. The p-values (reported in parentheses) are calculated from t-tests for the means and from Wilcoxon rank sum tests for the medians. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Above median industry concentration

Change from pre-filing year to year of rival's Chapter 11 filing of above median industry concentration

Variable	N	Mean	p value of t-stat	Median	p value of signed rank z-stat
Gross profit/sales	105	-0.794	0.27	-0.068	0.98
Operating profit/Assets	105	-0.042	0.86	0.066	0.05**
SGA/Sales	105	-0.110	0.63	-0.310	0.03**
Sales/Assets	105	0.319	0.13	0.026	0.17
Percent change in assets	105	-0.339	0.53	0.124	<.0001***

Panel B: Below median industry concentration

Change from pre-filing year to year of rival's Chapter 11 filing of below median industry concentration

Variable	N	Mean	p value of t-stat	Median	p value of signed rank z-stat
Gross profit/sales	105	-0.371	0.56	-0.032	0.73
Operating profit/Assets	105	0.822	0.21	0.089	0.00***
SGA/Sales	105	0.011	0.97	-0.078	0.18
Sales/Assets	105	0.009	0.80	0.011	0.65
Percent change in assets	105	-0.073	0.69	0.124	<.0001***

Table 6 presents changes in several adjusted financial measures for rival portfolios beginning at time -1, the fiscal year end prior to their distressed rival's Chapter 11 filing to the subsequent (filing) year. In the concentrated subsample results in Panel A, the change in adjusted sales-to-assets is insignificant but there is a significant (in the median) increase in the size of assets between the two years. The operating profit and SGandA show significant (at 5% level) improvements in median terms as well.[8] Panel B presents the results for the subsamples for firms operating in competitive industries. For the subsample operating in competitive industries, the adjusted operating profit margin improves significantly and is economically more significant than that for the concentrated subsample. In both subsamples, the increase in operating profits (scaled by assets) arises

Table 7
Multivariate regression of changes in SGandA of rivals around filing year

This table presents the results of regressing the changes in rival portfolio's Compustat-adjusted SGandA from the pre-filing year (-1) to the filing year (0). Rival firm leverage is calculated as the average of the rival's total liabilities-to-total assets at year -1 and -2 relative to filing. Filing firm RandD intensity is RandD expenses/total assets for each bankrupt firm calculated as average of RandD expenses-to-total assets at year -1 and -2 relative to filing. Industry concentration is the Herfindahl index calculated for each filing firm using all the firms in the same 4 digit SIC code. The degree of economic (v. financial distress) is proxied using the measure described in Table 2. Industry distress is an indicator variable that equals one if stock return of the median firm in the filing firm's industry is less than -30% in the 12 months immediately prior to Chapter 11 filing. Filing firm size is the log of the book value of total assets of the filing firm averaged at year -1 and -2 relative to filing. Prepackaged filing is a dummy variable that equals one if the firm's Chapter 11 is a prepackaged bankruptcy, and zero otherwise. Models 1—3 use the full sample while models 4 and 5 use subsamples with industry concentration above (below) the sample median. The t-statistics are presented in parentheses are heteroscedasticity-robust.

Dependent Variable	Change in SGandA for rival portfolios of filing firms from pre-filing to filing year		
	Full sample (1)	Above median industry concentration (2)	Below median industry concentration (3)
Intercept	-0.373	-0.567	-0.169
	(-0.52)	(-0.75)	(-0.12)
Filing firm degree of economic distress	0.105	0.139	0.053
	(2.33)**	(2.77)***	(0.79)
Industry distress	-0.366	0.905	-1.470
	(-0.81)	(1.52)	(-2.33)**
Filing firm size	0.009	0.021	0.062
	(0.09)	(0.19)	(0.38)
Rival firm leverage	0.132	0.265	0.310
	(0.51)	(1.13)	(0.57)
Filing firm RandD intensity	-12.87	-16.87	-5.795
	(-1.67)*	(-1.08)	(-1.29)
Industry concentration	-1.348	-2.825	-1.908
	(-0.96)	(-1.35)	(-0.30)
Prepackaged filing	-1.174	-1.095	-1.248
	(-2.56)***	(-1.92)*	(-1.88)*
# of observations	210	105	105
p-value of F statistic	0.007	0.001	0.224
Adjusted R-squared	0.056	0.152	0.023

despite the statistically significant increase in asset size. The source of the increase in operating profit seems to arise for improved selling efficiencies as seen from the decline in SGandA for both concentrated and competitive industries. There is a drop in SGandA in concentrated industries which is significant at the 5% level but surprisingly, firms operating in competitive industries also experience significant declines in SGandA.

In order to identify whether the changes in the operating profits and SGandA of the rivals are related to the filing firm's distress, we run a multivariate regression with the change in Compustat-adjusted SGandA around the filing year as the dependent variable. The independent variables remain the same as in previous regressions. Table 7 presents the results of the regression. Column 1 presents the results for the full sample while Columns 2 and 3 present results for subsamples of concentrated and competitive industries respectively. As can be seen from Column 1, for the full sample, as the filing firm's degree of distress goes up numerically i.e. the filing firm moves from pure economic distress to pure financial distress, and therefore is more likely to emerge as a standalone firm, the SGandA of the rival portfolio increases. Therefore, change in SGandA is positively correlated with the degree of economic distress. This is expected since a rival stands to gain more in terms of selling efficiencies if the filing firm disappears. Results in Column 2 and Column 3 indicate that changes in SGandA are related to the filing firm's degree of economic distress only in those firms which operate in concentrated industries. Both the coefficient size and significance increases in the concentrated subsample and declines to insignificance in the competitive subsample. Therefore, only firms in concentrated industries stand to gain if their rival potentially disappears due to the effects of distress. The indicator for industry distress is significant only in the competitive subsample and indicates that rivals operating in competitive industries appear to have lower SGandA if the industry is distressed. This might be possible if lower SGandA is associated with declining sales and by extension, declining selling costs. Untabulated results using the change in Compustat-adjusted operating profits over the same period as the dependent variable shows qualitatively similar results (i.e. firms in concentrated industries experience increases in operating profits if the rival filing for Chapter 11 is more economically distressed rather than financially distressed).

In summary, after examining changes in operating performance around the filing year, we find that all rival portfolios in the sample experience significant improvements in operating profits, declines in SGandA and increases in asset size. However, there is no evidence to point towards increases in actual sales. When considered in a multivariate setting, changes in SGandA in only the concentrated subsample of rivals is shown to be related to the filing firm's degree of economic distress. As the filing is less likely to emerge from the filing as a standalone firm if it is economically distressed, its competitors improve their selling efficiency more.

V.   CONCLUSION

This study shows that the competitive effects of bankruptcy arise from the event of rival filing and not necessarily due to the pre-filing distress of rivals. Around the event windows surrounding the distress date (date of first news about filing firm's distress), rival firms operating in concentrated industries experience negative abnormal equity returns i.e. contagion effects. However, the event of filing is associated with an increased likelihood that the distressed firm will be eliminated from the industry. Consistent with

this hypothesis, we observe competitive gains in abnormal equity returns around the filing dates for rivals in concentrated industries. Such competitive gains depend on the likelihood of the rival emerging successfully and results show that if the filing firm is economically distressed and therefore, has a lower likelihood of emerging as a standalone firm, rivals gain more. On the other hand, rival firms operating in competitive industries lose both during the distress- and the filing- period. In competitive industries, rivals operating in distressed industries experience greater contagion during the distress period and a filing firm which is more financially rather than economically distressed (and would therefore have a higher chance of survival) seems to have positive effects on its rivals.

Turning to operating performance changes over the filing period, univariate tests show that rival firms gain in assets, operating margins and lower costs during this period. However, these changes are linked to the chances of survival (in the form of economic versus financial distress) of the filing firm for only those rivals operating in concentrated industries.

ENDNOTES

1. http://lopucki.law.ucla.edu/
2. BAPCPA amended a number of provisions applicable to chapter 11 cases such as amendments to 11 U.S.C. §§ 1112, 1121, and 1129 set deadlines for the filing of plans and disclosure statements and for plan confirmation.
4. Under BAPCPA, the entire process of assumption or rejection of leases must be completed within 210 days whereas pre-BAPCPA, debtors were allowed 60 days but with potential for extensions.
5. Dropping the post BAPCPA bankruptcies leads to weaker results due to a much smaller sample size though the trends and directions observed remain qualitatively similar.
6. http://lopucki.law.ucla.edu/tables_and_graphs/Filings_by_year.pdf
7. Value weighting the portfolios leads to similar results.
8. Results are robust to inclusion of year and industry fixed effects.
9. To ameliorate the concern that the insignificance of the change in sales/asset ratio is driven by the large changes in assets, we calculate the percentage change in sales (not tabulated) and find it to be insignificant.

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