

Bankruptcy Protection and Stock Market Behavior in the U.S. Airline Industry

Delta Air Lines and Northwest Airlines, two of the largest US carriers, filed for Chapter 11 protection within minutes from each other on September 14 2005, and, by doing so, joined the long list of U.S. carriers seeking the shelter of the bankruptcy courts. United Airlines, one of the oldest names in the business, was poised to exit and join US Airways, a two-time Chapter 11 bankruptcy filer, in the unprotected world, at the time of their filing. Stephen Gong analysis bankruptcy protection in the U.S. airline industry and the consequences this may have on share trading and stock market behaviour.

By Dr. Stephen X.H. Gong

Introduction

Bankruptcies had been very rare in the regulated U.S. airline industry before the Air Deregulation Act of 1978. Since then, however, there have been well over 160 bankruptcy filings, and half of these have been for airlines with more than \$100 million in assets, which is an indication that the size of bankrupt airlines is increasing. Some, like Continental Airlines, another double-dip filer, are still in business, while others like twice-in twice-out Braniff, or thrice-around TWA, are not. Compared to the average failure rate for all types of businesses, U.S. airlines have failed more often than other businesses. Airline failures were several times more common in certain

years than for businesses overall, according to a report published by the U.S. Government Accountability Office in 2005.

This “revolving door” scene in the U.S. airline industry has fueled the continuing debate, both at home and overseas, about the influences that lenient U.S. bankruptcy laws have on the industry’s competitive landscape. Many, not limited to those outside the U.S., hold that Chapter 11 reorganization is an artificial and indirect subsidy, giving weak companies unfair advantages and allowing them to continue predatory pricing, to the detriment of their competitors. Some industry experts liken the bankrupt carriers

enjoyed by U.S. airlines under bankruptcy protection vis-à-vis their competitors. To date, however, there is, at best, mixed evidence on whether or not airlines under bankruptcy protection contribute to industry over-capacity, or gain an advantage over rivals, for example, by lowering fares and thus gaining traffic.

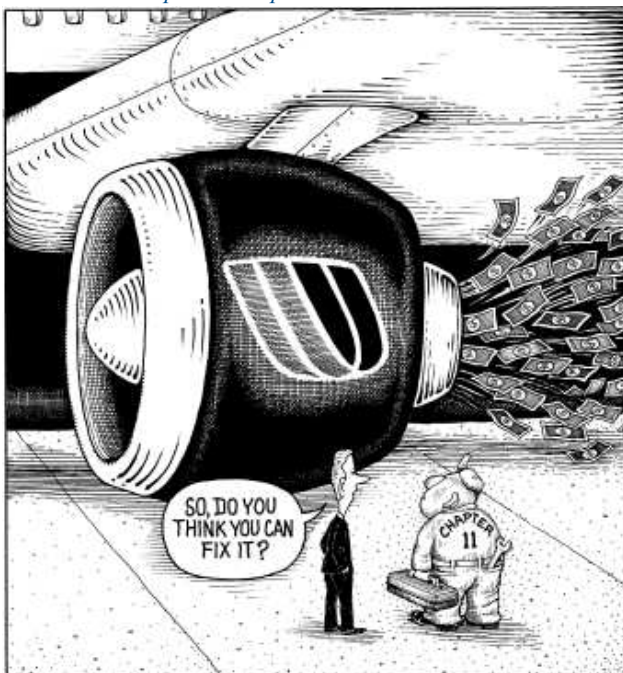
In a recent study (forthcoming in the Journal of Air Transport Management), I made an attempt to contribute to the academic literature and the public debate about the effects of airline bankruptcy on the industry by focusing on the short-term and longer-term stock market behavior (as opposed to product market conduct, the focus of existing studies) of airlines operating under bankruptcy protection. A key focus is the contemporaneous stock market behavior of the rivals of the bankrupt airlines. The results, based on the stock market reactions, provide independent evidence on the influences that bankruptcy protection has on the U.S. airline industry, under the maintained hypothesis of efficient capital markets where stock prices reflect all available information about a company’s future profitability.

Bankruptcy Protection and Airline Pricing Behavior in the Product Market

Existing studies have found mixed evidence in respect of the influences of bankruptcies on airline’s pricing behavior in the product market. Borenstein and Rose (1995) examine changes in the fares charged by bank-

to a virus that will eventually infect the entire industry. Martin Broughton, British Airways Chairman, said that the “iniquitous US bankruptcy laws prop up the walking dead” (Airline Business, October, 2005). Government financial assistance (especially in the wake of the September 11 Terrorist Attacks), debts write-off and cost savings from renegotiating labor and other contracts, are often cited as major advantages

Picture 1: “Chapter 11” repair service



rupt U.S. airlines and their competitors on domestic routes during the one-year period (six months prior to, and six months after, filing for Chapter 11). Their analysis indicates that airlines reduce their prices on average by 5-6 per cent prior to a bankruptcy filing, but do not further cut fares after entering Chapter 11. However, the bankrupt airlines experience statistically significant declines in market share on routes they continue to serve, despite the price cutting. Their competitors, on the other hand, are found to exhibit little price response to the bankruptcy filing. The competitors experience modest price declines when the to-be-bankrupt airlines cut their prices, but this decline appears to be more than offset by price increases over the subsequent months.

Somewhat contradictory evidence is provided by Barla and Koo (1999), who examine the airfare changes on dense city-pair routes served by U.S. airlines under bankruptcy protection. They find that, within 12 months of being declared bankrupt, an airline does not charge significantly different prices than those charged in markets where no financially weak carrier is present. Its rivals, in contrast, appear to slightly cut their prices. The Chapter 11 airline lowers prices after achieving cost savings, once bankruptcy is declared. Rivals of a Chapter 11 airline are found to react to the bankruptcy by further lowering their prices, with the extent of the price cuts being greater than those of the bankrupt airline. Such aggressive pricing by rivals, Barla and Koo suggest, may have contributed, in part, to the huge financial losses of the U.S. airline industry in the early nineties. A recent study by Government Accountability Office, however, finds no evidence that bankruptcy protection has led to overcapacity and under pricing that have harmed healthy airlines, either in individual markets or to the industry overall.

Stock Market Behavior of the Bankrupt Airlines and their Rivals

Although a Chapter 11 filing generally causes a publicly traded company's stock to be delisted from its primary stock exchange, many stocks that are

Table 2: Key financial indicators of bankrupt firms before and after filing for bankruptcy

	Bankrupt firms fiscal year relative to year of bankruptcy (0Y)				Healthy firms	
	-2Y	-1Y	0Y	1Y	Average (-2Y to 1Y)	Average over all years
Price-to-book	1.55	-0.18	-0.19	0.04	0.31	1.28
ROA (%)	0.34	-14	-666	-88	-192	2.67
EPS	-0.58	-20.80	-27.34	-7.86	-14.14	-0.0005
Debt ratio (%)	55.66	96.54	18.27	27.15	49.40	56.18
Current ratio	0.77	0.66	0.88	0.71	0.76	1.10
Pretax interest coverage	2.88	-11.45	-33.22	-1.31	-10.78	3.83

Source: Compustat

de-listed quickly resume listing as over the counter (OTC) stocks. The stock is typically nullified by order of the bankruptcy court, once a company emerges from Chapter 11, which thus renders the shares worthless. Nevertheless, the common stocks of some Chapter 11 companies are continuously traded throughout the bankruptcy, and it is not unusual for investors to actively trade in stocks of companies under bankruptcy protection, in the hope of benefiting from large price swings when circumstances change during or after the reorganization. Eberhart et al. (1999), for example, find evidence of large, positive excess returns, with the average cumulative abnormal return varying from 24.6 per cent to 138.8 per cent, in the 200 days that follow a firm's emergence from bankruptcy.

The current study focuses on U.S. passenger airlines that filed for Chapter 11 during the period 1978-2005. A company must meet a number of criteria to be selected, including available stock market data for both the filer and for their rivals, with the latter identified with reference to newspaper reports and other publications. To avoid confounding effects, a rival is excluded if it is operating under bankruptcy protection or has undergone other major corporate events during the relevant time period. The final sample consists of 8 firm-events. The Chapter 11 filers, the date on which each filing was made, the date each emerged from bankruptcy, and their corresponding rivals, are listed in Table 1 (see appendix).

Following the standard event study methodology in financial research,

the stock price reaction of the filer and its rivals upon and subsequent to the announcement of a Chapter 11 filing is measured by the abnormal return and cumulative abnormal returns over varying event windows. In all cases, the period under examination is before the airline emerges from bankruptcy.

It is interesting to first compare the financial characteristics of the sample Chapter 11 airlines in the two years prior to, throughout one year subsequent to the filing of bankruptcy, with those of a group of healthy airlines that have never entered bankruptcy (see Table 2).

The average price-to-book ratio of the bankrupt firms declines from 1.55 two years prior to the filing, to -0.18 one year prior to the filing. The ratio drops to -0.19 during the year of filing for bankruptcy, before climbing back up to 0.04 one year subsequent to the filing. Not surprisingly, the stock prices of the to-be-bankrupt firms fall substantially below the book value of equity, to only a factor of 0.31, in the four-year period surrounding the filing. This compares with a value of 1.28 for the healthy airlines.

The Chapter 11 airlines have extremely low or, in most cases, negative return to assets (ROA) and earnings-per-share (EPS) in terms of operating and financial performance during the relevant period. These magnitudes of heavy losses may have either caused or precipitated their failures. The ROA (EPS) for the healthy airlines is also low at 2.67 per cent (close to zero), indicative of the industry's overall dismal performance.

The total debt to capitalization ratio, or debt ratio, of the bankrupt airlines is moderate, at 55.66 per cent two years prior to the filing, but climbs quickly to 96.54 per cent one year prior to the filing. The drop back to 18.27 per cent at the end of the year of filing for bankruptcy most likely reflects the result of the reorganization (e.g. debts write-off or elimination of defined-pension contributions). The debt ratio of the bankrupt firms, averaged over all four years, is comparable to that of the healthy airlines.

There is little change in the current ratio of the troubled airlines during the period under examination, but the average of 0.76 over all years is still lower than that of the healthy airlines, which is 1.1, a figure that conforms to the textbook “benchmark” of being about adequate. More revealing than the current ratio, however, is the pretax interest coverage, which measures a company's ability to meet its debt obligations (total interest payable on bonds and other contractual debt), and which, if failed, could force them into bankruptcy. This ratio is 2.88 two years prior to the filing, but deteriorates rapidly to -11.45 and -33.22 one year prior to and during the year of the filing, respectively. The average interest coverage ratio during the four years surrounding the filing of bankruptcy is -10.78, compared with a value of 3.83 for the healthy firms. It should be noted that the failure to meet the debt obligations may just be

Picture 2: Paper plane, ‘plane’ money...



Table 3: Average raw returns and systematic risk of bankrupt firms and their rivals

Group	Event window	Bankrupt firms (N=8) ¹	Rivals (N=35) ¹
Average total raw return	[-200, -50]	-46%	-7%
	[50, 250]	32%	48%
	[50, 600]	298%	100%
Average beta ²	[-390, -300]	1.49	1.71
	[-290, -200]	2.00	1.68
	[50, 300]	0.25	1.96

¹ Number of observations varies across different event windows depending on data availability.

² Scholes and Williams (1977) beta calculated using CRSP value-weighted market index.

a symptom, rather than the cause, of their business failure.

The key focus of this study is on the stock market performance of the bankrupt airlines and their rivals in response to the filing of bankruptcy. Table 3 reports the unadjusted raw returns and betas of the Chapter 11 firms and their rivals during various event windows (with the date of bankruptcy filing defined event date 0). The bankrupt firms (rivals) experience an average total raw return of -46 per cent (-7 per cent) during the 150-day period ending 50 days before the filing of bankruptcy (i.e. [-200, -50]). Thus, the to-be-bankrupt companies' stock prices appear to reflect or anticipate their poor product market performance well before they subsequently fall into bankruptcy. Their rivals, in contrast, do not suffer particularly obvious adverse effects, although this conclusion must await further evidence based on risk-adjusted stock returns.

The bankrupt firms reverse their stock market performance (after substantial falls at the time of the filing) during the

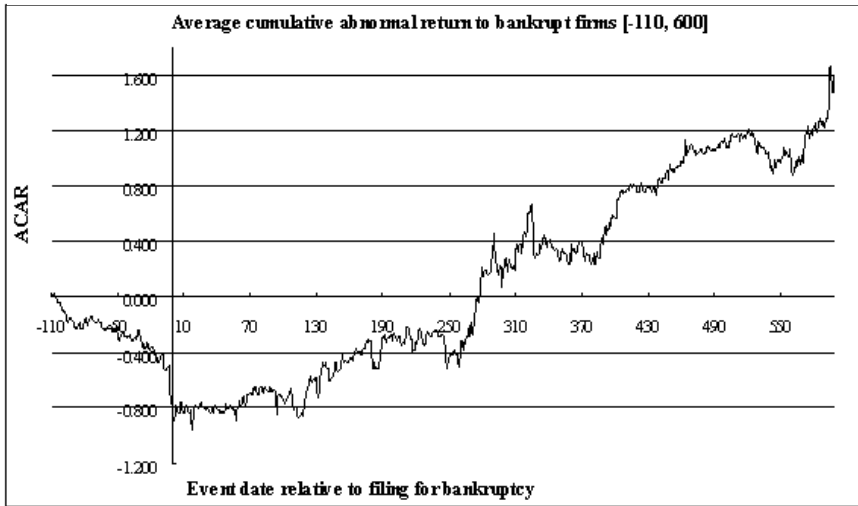
200-day period starting 50 days subsequent to the bankruptcy filing (i.e. [50, 250]), and experience strong positive raw returns totaling 32 per cent on average. Interestingly, the rivals also experience large positive returns totaling 48 per cent on average. The magnitudes of these positive gains are even greater in the event window [50, 600], during which the stocks of airlines operating under bankruptcy protection experience close to 300 per cent total raw return on average, and their rivals 100 per cent raw return on average. The initial evidence, therefore, is consistent with the hypothesis (and reports in the popular press about spectacular returns for such firms) that the bankrupt firms are perceived to benefit from Chapter 11 protection.

The key results, based on risk-adjusted abnormal returns, are reported in Table 4 (see appendix).

The market-model-based average cumulative abnormal return (ACAR) for the bankrupt firms during event window [-50, -5] is -10.16 per cent, which is not statistically different from zero. This rapidly falls to a highly significant -35.59 per cent and -14.64 per cent during event windows [-1, 1] and [-1, 0], respectively. The bankrupt firms on average only experience an abnormal return of -4.82 on the date the bankruptcy is filed, which is statistically significant. The above evidence suggests that much of the change in stock price has occurred before the actual filing. The ACAR is -40.29 per cent during the five days centered on the filing, i.e. event window [-5, 5], which is both statistically and economically significant. This, however, is not surprising when a firm fails.

Of special interest is the observation that the bankrupt firms' stock market performance is largely reversed after

Figure 1: Average cumulative abnormal returns to firms in bankruptcy protection



the filing. The ACAR is 25.56 per cent during the event window [5, 50], 40.45 per cent during the event window [15, 100], and 117.76 per cent during the event window [50, 250]. All of these are statistically significant at the 1 per cent level or better. Even more surprisingly, the ACAR rises to 482.04 per cent during the event window [50, 600], which is statistically significant at the 0.1 per cent level. The results are essentially similar when the abnormal returns are calculated using other methods (studies show that the results in event study are not sensitive to the choice of the estimation methods, especially when the magnitude of the abnormal returns is large). The time trend of the ACAR of the bankrupt firms throughout the period from 110 days prior to the filing, until 600 days subsequent to the filing, is depicted in Figure 1.

The stock price behavior of the rivals of the bankrupt firms is presented in the last two columns in Table 4. During the event window [-50, -5], the rivals experience slightly positive abnormal returns, but these are not statistically significant. However, these rivals experience statistically significant and positive abnormal returns ranging from 2 to 3 per cent during the two to three days surrounding the filing (i.e. [-1, 0], [-1, 1], and [0, 0]). The rivals also experience positive, albeit not statistically significant, abnormal returns during the event window [-5, 5].

The rivals experience on average statistically positive and large abnormal returns in the longer term after the bankrupt firms file for bankruptcy.

These steadily climb from 8.87 per cent during event window [5, 50], to 51.19 per cent during event window [50, 600]. It should be noted that while the rivals' ACAR in the post-filing periods are generally much smaller in magnitude than those of the bankrupt firms, they are nevertheless large. Figure 2 depicts the time trend of the ACAR of the rival firms. As is apparent, the rivals experience slightly positive stock price changes starting from 80 days prior to the filing of bankruptcy, but the most noticeable gains occur subsequent to the filing. The ACAR continues to trend up, until it reaches a value of 44 per cent 150 days after the filing.

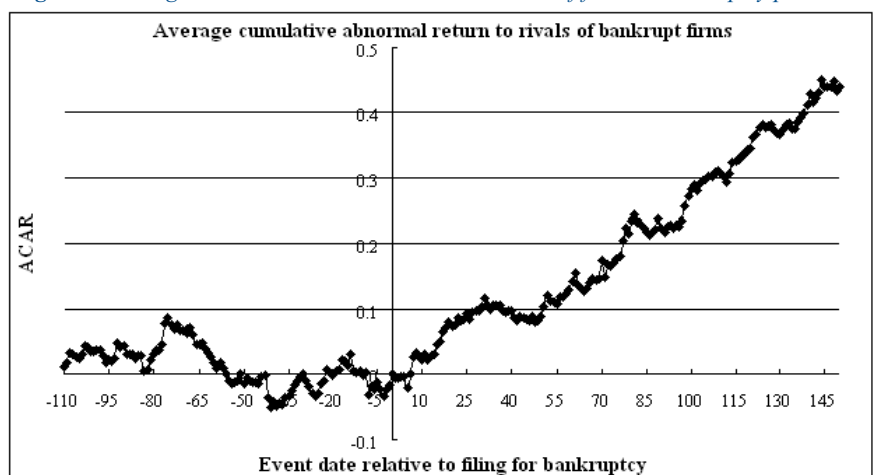
The positive stock price performance of the rivals of the bankrupt airlines, both at the time of the filing of bankruptcy and in a relatively long period after the filing, suggests that investors perceive that the positive effects on the rivals (arising from a shift in competitive position) outweigh the nega-

tive effects (arising from contagion or spillover effects) associated with the bankruptcy of an industry competitor. This can happen, for example, when rivals gain traffic from the failing competitors (a phenomenon that is well documented in the popular press), or when the rivals are expected to increase their market power (and possibly fare prices) following the elimination of a competitor.

Concluding Remarks

The predominantly positive stock price performance of the bankrupt airlines following the filing of bankruptcy (the selection and survivorship bias notwithstanding) indicates substantial improvement in the perceived financial condition of the airlines operating under bankruptcy protection. Interestingly, the rivals of the bankrupt airlines are found to benefit, rather than suffer, from the bankruptcy filings. While not necessarily refuting the argument that allowing airlines to file for bankruptcy adversely affects their rivals or the entire industry, the rivals' large, positive stock price reactions upon the filing of bankruptcy by their competitors most likely reflect the stock market's evaluation that the rivals will benefit from the revealed weakness or imminent failure of firms in the same industry. In part, the benefit may arise from the industry consolidation that can result from the bankrupt airlines being acquired (or anticipated to be acquired) by the healthy rivals, a situation that is consistent with the positive stock price performance for both the bankrupt firms and their competitors after the bankruptcy filings.

Figure 2: Average cumulative abnormal returns to rivals of firms in bankruptcy protection



Appendix

Table 1: Sample description

Bankrupt firm	Date of filing (emergence)	Rivals ¹	Remarks
Continental	1983/09/24 (1986/06/30)	UAL; Northwest; AMR; Delta; US Air ²	Rivals exclude Pan American (major strike).
America West	1991/06/27 (1994/08/23)	AMR; Delta; Southwest; Mesa; UAL; US Air ²	Rivals exclude TWA and Northwest (no return data) and Continental (operating under bankruptcy protection).
Continental	1990/12/03 (1993/04/27)	Delta; UAL; AMR; US Air ²	Rivals exclude TWA and Northwest (no return data).
Delta ³	2005/09/14 (N/A)	AirTran; Southwest; AMR; Continental; US Airways Group ²	Rivals exclude UAL and Northwest (operating under bankruptcy protection).
Hawaiian	2003/03/21 (2005/06/02)	Mesa; UAL; Continental; Delta; Northwest; AMR	
Northwest ³	2005/09/14 (N/A)	N/A	
US Air ²	2002/08/11 (2003/03/31)	Northwest; Hawaiian; Continental; Delta; Southwest; AirTran	Rivals exclude UAL (operating under bankruptcy protection).
United Airlines	2002/12/09 (2006/02/01)	Southwest; Frontier; America West; Northwest; AMR; Delta; Continental	Rivals exclude US Air (operating under bankruptcy protection).

¹ Rivals are identified as such in news reports and other publications and are subject to stock market data availability.

² US Air merged with America West in September 2005 and formed the US Airways Group. Prior to this, each company is treated as a separate entity.

³ Northwest and Delta filed for bankruptcy on the same date and share essentially the same rivals. Although the stock price behavior of both firms is analyzed, the stock price behavior of their rivals is analyzed only once in order to avoid double counting.

Table 4: Average cumulative abnormal returns of bankrupt firms and their rivals surrounding filing of bankruptcy

Average Cumulative Abnormal Returns (ACAR) %				
Event Window	Bankrupt firm (N=8) ¹		Rivals (N=35) ¹	
	Market model	SW ² model	Market model	SW ² model
[-50, -5]	-10.16	-11.89	1.64	1.19
[-1, 0]	-14.64***	-14.28***	3.22***	3.01***
[0, 0]	-4.82**	-4.36**	2.24***	2.19***
[-1, 1]	-35.59***	-35.47***	2.37**	2.03*
[-5, 5]	-40.29***	-39.48***	1.64	1.19
[5, 50]	25.56**	25.81**	8.87**	6.69*
[15, 100]	40.45**	39.55**	23.14***	19.71***
[50, 250]	117.76***	120.56***	29.14***	23.42***
[50, 600]	482.04***	512.92***	51.19***	34.55**

¹ Number of observations varies across different event windows depending on data availability.

² SW = Scholes and Williams's (1977) model.

*, **, *** Significant at the 0.05, 0.01, 0.001 level, respectively.