



Contagion and competitive effects of plan confirmation of reorganization filings: Evidence from the Taiwan Stock Market

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ARTICLE INFO

Article history:
Accepted 13 August 2008

JEL classification:
G33

Keywords:
Contagion effect
Competitive effect
Confirmation of a reorganization plan
Market reaction
Hybrid neuro-fuzzy model

ABSTRACT

This paper aims to examine the intra-industry effects of confirmation of a reorganization plan. Using unique Taiwanese data on announcements of reorganization confirmation, I find evidence that such announcements elicit positive stock price reactions for the announcing firms and negative stock price reactions for other firms within the same industry. Specifically, negative competitive effects dominate positive contagion effects for industry rivals in the context of the announcement of a reorganization confirmation. Moreover, a hybrid neuro-fuzzy model is constructed, where five industry- and firm-level inputs are considered, to investigate which rivals enhance their position and which do not. Results show that my model is consistent and stable, and is good at classifying both contagion- and competitive-effect candidates.

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1. Introduction and background to the research

In recent years, increasing importance has been attached to research into the intra-industry wealth effect of bankruptcy announcements in the accounting and finance field, and such research has consistently pointed to an association between the equity value of firms announcing information and that of non-announcing firms within the same industry. This association, known as the contagion and competitive effect or information transfer effect, has been documented in different contexts. Warner (1977) examines the contagion effects of bankruptcy announcements in the railroad industry, while Aharony and Swary (1983), Diamond and Dybvig (1983), and Gorton (1985) investigate the contagion in the banking industry brought about by the failure of an individual bank.

According to the signaling hypothesis, investors use bankruptcy announcements by a firm to make inferences about its industry counterparts, since such announcements imply industry-wide cash flow problems and suggest that rival firms will be affected in the same manner as the announcing firm (contagion effects). That is, the worsening situation of the deteriorated factors could signal an adverse condition of the applicable industry as a whole, and, hence, investors may also expect downward prospects for other firms that operate in the same industry. Empirical studies by Lang and Stulz (1992) and Ferris et al. (1997), which focus on intra-industry stock price responses to Chapter 11 bankruptcy filings, and Cheng and McDonald (1996), which emphasize the stock price reactions to bankruptcy of surviving firms in the airline and railroad industries, support this hypothesis by

stating that the announcements of bankruptcy filing have significantly negative implications not only for the announcing firm's investors, but for investors in industry-related firms.

In addition to the contagion effect, past studies (e.g., Lang and Stulz, 1992; Haensly et al., 2001) have found that bankruptcy announcements may also evoke a competitive effect because they convey to the market place changes in the competitive position of firms in the industry. Specifically, given that some investors believe bankruptcy is due to events specific to the failing firm, e.g., fraud, such announcements strongly suggest the probability of complete exit from the market or the possibility of the eventual liquidation of the announcing firms. In such cases, non-announcing rivals in the industry are positively affected because a bankruptcy is an opportunity for them to improve profitability by increasing market share at the announcing firm's expense, and then the competitive effect would increase their share prices (Altman, 1984; Titman, 1984).

In a previous paper related to this topic, and focusing on the impact of a reorganization announcement on stock returns, Chi and Tang (2007)¹ argue that news of the filing of a reorganization plan has significant negative price implications for the filer's stockholder wealth for two reasons. First, the filer will undergo a distressed restructuring, a process that Eberhart, Moore, and Roenfeldt (1990)

¹ Chi and Tang (2007) sampled 62 Taiwanese firms that filed for reorganization to examine the impact of the reorganization filing announcement and the reorganization resolution announcement on the distressed-stock returns. Their purpose was to separate the investment winners (i.e., announcing firms whose investors experience at least +25% excess returns over a 30-day holding-period) from the losers, and to identify the characteristics of the winners. They described an *ex ante* trading strategy of investing in distressed stocks with a respective 30.65% and 46.77% likelihood of being a winner on the dates of reorganization filing and reorganization resolution.

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report averages about two years. Second, the uncertainty about any court rulings for such a firm causes an information asymmetry problem which in turn leads to the firm's being undervalued. In addition, a bankrupt firm's direct and indirect costs increase while in Chapter 11 (Lang and Stulz, 1992). The former are costs that are directly associated with the legal bankruptcy process (e.g., attorneys' fees, accounting fees, etc.) while the latter are the costs of consequential losses (e.g., lost sales, interrupted operations, loss of valuable employees, etc.).

It is well documented that a Chapter 11 filer continues bearing direct and indirect bankruptcy costs, thereby reducing its competitive position until the court approves its reorganization plan, allowing it to restructure and emerge from bankruptcy (Altman, 1984; Weiss, 1990). This suggests that the filer's court-approved plan not only allows its exit from bankruptcy but also has a positive effect on the wealth of its shareholders. Similarly, Chi and Tang (2005) provide adherent evidence that the stockholders of firms announcing reorganization ratification and out-of-court settlement react positively to such announcements, while the stockholders of firms announcing filing dismissal react negatively.² This positive wealth effects can be attributed to the fact that the court ratification of a reorganization plan resolves a major issue that has been clouding the filer's future and, thus, enables such a firm to concentrate all its efforts on increasing shareholder value.

Although there have been many studies in various areas of intra-industry effects, none has examined such effects in the context of the confirmation of a reorganization plan. Since, on the one hand, the information of the court confirmation of a reorganization plan is more reliable than other information disseminated to the public; on the other hand, the contagion and competitive effects compose part of the market response to plan confirmation for rival firms, an empirical examination would indicate which effect is dominant. Positive correlations across stock returns of industry rivals would imply dominant contagion effects, whereas negative correlations would indicate competitive effects.

In this paper, I use a unique Taiwanese dataset on announcements of reorganization confirmation to provide evidence on effects associated with the plan confirmation announcements of reorganization filings. The findings support my assertion that news of reorganization confirmations positively impacts on the equity value of the announcing firms. Furthermore, for other rivals in the same industry, my results indicate that competitive effects dominate contagion effects. A hybrid neuro-fuzzy model is constructed, where five industry- and firm-level inputs are considered, to investigate which rivals enhance their gains and which do not. The results show that my model is consistent and stable, and is good at classifying both contagion- and competitive-effect candidates.

The remainder of the paper is organized as follows. In the next section, I offer a description of the data I use and of the methodology of my analysis. Section 3 presents the results of the empirical analysis. Section 4 concludes.

² Chi and Tang's (2005) previous paper in this series aimed to construct neural network models to classify and predict the post-reorganization filing resolutions into three groups, namely out-of-court settlement, reorganization ratification, and application dismissal. In addition, they investigated the stock prices of the filing firms around the filing and the resolution dates in the light of each of the three post-reorganization filing resolutions. Their results revealed that the returns from the dismissed firms were worst and that those from the firms that settled out-of-court were best. That same study focused on the wealth effects of post-reorganization filing resolutions on the filing firm, whereas the present study focuses not only on the effects of confirmation of a reorganization plan on the filer, but also on the intra-industry contagion and competitive effects of a reorganization confirmation on competitors.

2. Empirical analysis: data and methodology

2.1. Data source

The period covered is from 1 January 1987 to 1 February 2006. My sample of plan confirmation of reorganization filings is obtained from the Market Observation Post System of the Taiwan Stock Exchange Corporation (TSEC) and the Extemporary Newspaper Headline & Index Database. Daily stock returns and other financial data of listed firms are compiled from the Taiwan Economic Journal (TEJ) database, but when these data are not available, company annual reports, TSEC, and Compustat Global Data are employed. In order to ensure the accuracy of event dates and data related to the reorganization confirmations, all public announcements from 1987 to 2006 have been double checked manually.

I eliminate firms in foreign-based entities, financial services institutions, and announcers for which the court-related data required for the analyses are missing or where discrepancies cannot be resolved. In addition, I require announcers to have at least one industry match, or have adequate return data 250 days before and 20 days subsequent to plan confirmation available in the database. This results in a final sample of 59 announcers operating in 15 industries. Rival firms operating in the same industry as the announcer are chosen according to the TEJ four-digit industry classification code. This initial sample of industry rivals is then screened to exclude the announcer and any rivals that experience other contemporaneous contaminating events during the research window. As a result of this screening process, a clean sample of 1289 rivals is available for this empirical analysis.

A neuro-fuzzy model in year Y_{C-1} , i.e., the last fiscal year preceding the plan confirmation, is built to explain how the market responds toward portfolio rivals as a result of any leakage of information about the court ratification of the reorganization plan. The first 753 industry rivals (1987 to 2000) serve as a model construction dataset, which is randomly partitioned into a model estimation dataset ($n=502$) and a test or hold-out dataset ($n=251$). The remaining 543 industry rivals (2001 to 2006) are used for the final validation of the model's reliability.

2.2. Market model

The prediction error, or abnormal return, as described in the appendix to Dodd and Warner (1983), has been chosen as appropriate for the purposes of this study. For stock j , the daily prediction error (PE_{jt}) is estimated as:

$$PE_{jt} = R_{jt} - \hat{\alpha}_j - \hat{\beta}_j R_{mt} \quad (1)$$

I compute $\hat{\alpha}_j$ and $\hat{\beta}_j$ using data from a 250-day pre-event estimation period prior to the date of plan confirmation ($t=0$). R_{jt} is stock j 's market return on day t , and R_{mt} is the market return on an equally-weighted market portfolio drawn from the TSEC and TEJ daily returns file on each day t for the interval of interest. For stock j , the cumulative prediction error (CPE) is the sum of the PE over the event day T_{1j} to T_{2j} , and is computed as below:

$$CPE_j = \sum_{t=T_{1j}}^{T_{2j}} PE_{jt} \quad (2)$$

2.3. Variable selection

$RCPE_{-5 \text{ to } +5}$ (rival cumulative prediction error) centered on the date of plan confirmation is used as the dependent variable in my neuro-fuzzy model. An industry rival is thus categorized as a contagion effect candidate if its holding-period $CPE_{-5 \text{ to } +5}$ is positive. This generates 603 contagion effect candidates and 693 competitive effect candidates over

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