

The Effect of Bankruptcy on Strategic Alliance Partners

Audra L. Boone
University of Kansas

Vladimir I. Ivanov
Securities Exchange Commission

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Abstract:

We study the financial and operational impact to partner firms when the counter-party in an alliance or joint venture goes bankrupt. We find that the partner firms of strategic alliances experience a significant negative stock price reaction. We examine several factors that might drive the results, such as equity stakes and board seats, horizontal versus vertical arrangements, the degree of specialized assets, and liquidity constraints, but find that the negative stock price reaction is strongest in the subsample of firms with the greatest ties between firms, proxied by the length of the alliance agreement. Partners with equity stakes and/or board seats also experience negative stock reactions. Non-bankruptcy partners also experience drops in profit margins and investment levels in the subsequent two years with the worst performance concentrated among the longer-term agreements. There is very little impact on the returns or performance for joint venture partners, suggesting that these agreements are more insulating on the partner firm. Overall, while strategic alliance agreements and joint ventures can have positive benefits, they also subject firms to counter-party risk that must be considered at the inception of such an agreement.

JEL classification: G33, G34. L22

Keywords: Strategic Alliance, Joint Venture, Bankruptcy

I. Introduction

This paper provides new insight and evidence of a potential drawback to strategic alliance and joint venture arrangements – counter-party financial distress risk – by examining the operational and shareholder wealth effects on the partner when the other party files for bankruptcy. As partner firms develop their relationships and become more intertwined, each party also becomes increasingly reliant on the other partner’s well-being for their own future success and sustainability. The bankruptcy of one party can disrupt or even cease the benefits accruing from the relationship, potentially causing the other partner to experience its own financial or operational setbacks.

Prior research on strategic alliances and joint ventures has generally emphasized the beneficial aspects of such arrangements, such as increased funding for R&D and capital expenditures, access to new technologies, and risk sharing or information sharing that may not have been possible with one-off transactions. The positive announcement returns to alliance arrangements provide support for the valuable nature of these arrangements.

Despite the upside of collaborating with other firms, these arrangements have risks. The incomplete contract nature of these agreements can lead to opportunistic behavior by one of the parties (Masulis and Ivanov (2008)). Careful negotiation and contract structuring can help mitigate these concerns. For example, work by Lerner and Malmendier (2008) show how the ability of one party to *voluntarily* exit from the agreement could help resolve some incentive problems.

Our paper also examines risks in these arrangements, but is concerned with what happens when one partner files bankruptcy – often creating an *involuntary* exit from the

arrangement. Since these agreements occur between legally distinct firms – each with its own financial and operational arrangements – it’s possible that each party may be insulated enough to not experience significantly negative repercussions from a partner bankruptcy. Furthermore, if the parties anticipate future financial problems, then they may structure the arrangement to limit the reliance and exposure to the weaker partner. On the other hand, if the two firms are co-dependent and intertwined with each other’s success, then one firm’s distress, and the collapse of a once valuable alliance, could cause the other partner to experience its own financial problems.

Our work also is motivated by previous studies that have documented important spillover effects of financial distress and bankruptcy filings on customers, suppliers, and competitors (see Hertzfel, Li, Officer, Rogers (2008)). We extend the knowledge of bankruptcy valuation effects to strategic alliances and joint ventures. Given the growing frequency and size of these types of arrangements, it is important to understand the potential downside consequences to becoming intertwined with another firm’s fortunes.

We study both strategic alliances and joint ventures. While strategic alliances are collaborative arrangements between distinct firms set up to reach a common goal, joint ventures (JVs) involve the parties agreeing to create a new legal entity whose business is conducted separately from the contributing parties’ core operations.

Generally in JV arrangements each party contributes financial and/or intellectual capital to the arrangement in return for an equity stake in the new entity. Both strategic alliances and joint ventures involve significant negotiations where the parties reach an agreement on how to divide the income and intellectual/physical assets stemming from the venture. They must also allocate decision and control rights across the two parties.

Overall, JVs are more structured and rigid with more clearly defined boundaries, whereas the strategic alliances are more fluid with greater ambiguity regarding specific goals and ownership. Consequently, each type of arrangement possesses some distinct contractual features that could exacerbate or mitigate the impact of a counter-party bankruptcy. For example, a strategic alliance might be easier to unwind, but is more likely to involve the parties' core business practices. In contrast, the JV structure could better insulate the parties remaining assets, but relies heavily on the full participation of each party.

We take a three-pronged approach to study the bankruptcy effect on alliance partners. First, we examine the market reactions to strategic alliance and JV partners around two dates: a) the bankruptcy announcement date, and 2) the distress event date (defined later), by estimating $(-1,+1)$ and $(-2,+2)$ CARs. We find that the announcement of bankruptcy is significantly negative for strategic alliances but not JVs. Furthermore, the wealth effects are strongest for longer-term alliances.

Second, we examine whether the bankruptcy effects are stronger when contracting problems are higher or when the non-bankruptcy firm may be more reliant on the partner. In particular, we examine short-term versus long-term arrangements, low R&D versus high R&D industries, horizontal versus vertical agreements, and financially constrained versus financially unconstrained firms. In all instances we document significant wealth effects for long-term alliance partners and alliances with high estimated benefits. In addition, we study how the presence of equity stakes and board participation influence the bankruptcy impact and document significant negative wealth effects associated with the presence of those.

Lastly, we examine the partner firms' reaction to the bankruptcy by looking at changes in their current and quick ratios, sales growth, investments and profit margins, and debt levels. We find that profit margins and investment do tend to suffer in the subsequent years after a partner files for bankruptcy.

II. Prior Literature on Strategic Alliances and Joint Ventures

II.A Formation and Benefits

Much of the prior research in this area has focused on the value-enhancing aspects of strategic alliances. The potential benefits include learning and knowledge acquisition (Berg and Friedman (1981)), efficiency improvements, lower transaction costs and risk diversification (Stuckey (1983), Hennart (1988)), access to financing (Berg and Friedman (1981), Hennart (1988)), enhancement of competitive positions or market power (Kogut (1988)), and cooperation in the development of new technology (Gomes-Casseres, Hagedoorn, and Jaffe (2006)). Further work by Robinson (2008) provides theoretical and empirical support that these arrangements tend to occur when it is difficult to enforce contracts internally or when companies undertake diversifying operations.

Given all the benefits, it is not surprising that the inception of strategic alliances and joint ventures are on average value increasing. For example, McConnell and Nantell (1985) and Chan, Kensinger, Keown, and Martin (1997) find that alliance participants experience positive stock price reactions on the day the alliance is formed and observed improved operating performance in the following years. Allen and Phillips (2000) demonstrate that strategic alliances, joint ventures, and other product market relationships in conjunction with corporate block ownership lead to significant increases in target stock

prices and improvements in their profitability and operating performance. Pablo and Subramaniam (2002) show that strategic alliances coupled with equity stakes alleviate the capital constraints of smaller, high-growth firms and that these partnership announcements lead to significantly positive market reactions. Ivanov and Lewis (2009) find that IPO firms with alliances that commence before the offering tend to obtain higher IPO valuations, invest more, and grow faster than similar IPO firms without strategic alliances.

II.B Risks and Costs

Fewer studies, however, discuss the potential risks and costs of strategic alliances. Strategic alliances often suffer from a host of contracting problems, especially when they include very risky activities. Financial contracts in such settings are generally incomplete, and this challenging contracting environment can lead to opportunistic behavior by one of the two parties. For example, one party to the strategic alliance can exploit the other by exerting insufficient effort, underinvesting, or appropriating a disproportionately large share of the joint surplus created by the strategic relationship (Lerner and Malmendier (2008)).

The incomplete contracting literature (for example, Klein, Crawford, and Alchian (1978), Grossman and Hart (1986), Hart (1988, 2001), and Aghion and Tirole (1994)) shows that equity ownership and corresponding control rights can mitigate potential hold-up problems between parties to a strategic alliance. Matthews (2006) shows that ownership stakes by an established firm in an entrepreneurial alliance partner can serve to deter entry into the entrepreneur's market. Trade-offs occur because the equity stake can decrease the incentive to produce entrepreneurial effort.

II.C Voluntary Exits from Alliances and Joint Ventures

Alliance and joint venture arrangements may end for a variety of reasons. Often alliances are only structured to last for a particular length of time in order to achieve a common goal. If the usefulness of the agreement has reached an end or a goal has been achieved, then the two parties may mutually agree to disband the arrangement. There may be times, however, when one party voluntarily chooses to exit early. Recent work by Lerner and Malmendier (2008) shows that research agreements may contain walk-away provisions that allow the financing partner to unilaterally leave the agreement (with a fee payment), and even possibly award the intellectual property back to the financier partner as a way to ensure that the researcher does not reallocate the funds to other projects. Otherwise, agreements may be terminated for cause such as a breach of agreement or fraud.

II.D Forced Exits and Bankruptcy Law

Though the alliance or joint venture might still produce benefits for both parties, the bankruptcy filing by one party could put a premature end to the sharing agreement. Some contracts even appear to anticipate the possibility of such an event and stipulate the rights of the other party under these circumstances. For example, in an agreement reached between IMedcor and Direct Medical Solutions Corp on November 5th, 2009, the companies state that, “In the event that your business files for bankruptcy or ceases to operate for any reason the revenue share will cease immediately.”

Though the non-bankrupt partner is not generally responsible for the other party’s claims, it can still have a negative impact on its operations. U.S. bankruptcy law section 362 provides for an automatic stay that prohibits creditors, including alliance partners,

from collecting payments. So, a party to a strategic alliance or JV that had expected payments for its services would not be able to collect those funds if they were not considered part of normal operations and approved by a bankruptcy judge. Furthermore, U.S. bankruptcy law section 365 gives the bankrupt firm the right to accept or reject existing contracts and agreements for a period of time. Consequently, even if the bankrupt party survives and emerges from a Chapter 11 filing, the agreement may have been rejected or irreparably harmed during the process.

III. Data

Our strategic alliances sample spans the period 1989-2007 and comes from the SDC Platinum *Joint Venture* database. We require that all alliance partners are public companies with data on CRSP. We match the alliance sample with bankruptcy announcement dates from SDC Platinum's *Bankruptcy* database. This process leads to 130 alliance partners with bankruptcy announcements and 288 non-bankrupt alliance partners for a total of 366 unique strategic alliances. Of these, 84 arrangements are joint ventures (JVs). We separate the JVs from the rest of the alliances because they include the establishment of a separate legal entity with assets contributed by the partners. As discussed earlier, this structure could have significant implications for the effect of a partner's bankruptcy on the healthy partners.

Table 1 presents summary statistics for our sample. We have 427 unique combinations bankruptcy/non-bankrupt alliance partner (Panel A). Panel B shows the annual distribution of bankruptcy announcements. The majority of these occur in 2001-2003, the period after the internet bubble bust. As seen in Panel C, almost half of the

sample of alliance partners is concentrated in business services (sic 73), telecommunications (sic 48), electronic and electrical equipment (sic 36), industrial machinery (sic 35), and electric and gas services (49).

IV. Alliance Partners' Wealth Effects around Bankruptcy Announcement Dates

In this section we estimate the wealth effect of bankruptcy announcements and pre-filing distress on healthy alliance partners. To do this, we construct cumulative abnormal returns (CARs) using the market-adjusted returns model (Brown and Warner, 1985) and the value-weighted market return from CRSP. We examine both CAR(-1,+1) and CAR(-2,+2).

Research on intermediary arrangements – such as strategic alliances and joint ventures – that lie somewhere between independent market contracting and full integration via a merger result in positive wealth gains (McConnell and Nantell (1985); Johnson and Houston (2000); and Chan, Kensinger, Keown, and Martin (1997)). If one party goes bankrupt, then the benefits gained from these arrangements are likely to be diminished or in the worst case scenario could cease completely. We hypothesize that the bankruptcy filing will result in a negative stock price reaction, reflecting the loss of the synergies.

IV.A. Wealth Effects around Bankruptcy Announcement Dates

The results for the bankruptcy announcements are reported in Table 2. We find that alliance partners generally exhibit a negative stock price reaction to the bankruptcy announcement of the other alliance partner. The results are marginally significant for CAR(-1,+1), but not for CAR(-2,+2). When we parse the sample, we find that the

reaction is much stronger for strategic alliances than joint ventures. The CAR(-1,+1) for strategic alliances is -0.6%, which is significant at the 5% level, while the abnormal return for JVs is not significant. This difference could be due to the fact that JVs, which involve the creation of a separate legal entity, tend to isolate the healthier partners from the negative impact of a partner's bankruptcy.

Next, we investigate whether the importance of the agreement plays a role in the stock price reaction of the healthy partners to a bankruptcy announcement. We measure importance by the length of the agreement between the parties, using the sample median (4 years) as a cut-off point. We find that the effect of the bankruptcy announcement is much stronger for longer (and hence more important) strategic alliances. For example, CAR(-1,+1) for that sub-sample is -1.12% (t-stat=2.42). The wealth effect for shorter alliances and JVs are negligible.

Since bankruptcy announcements could be predicted by the market and thus the CAR(-1,+1) and CAR(-2,+2) from the previous subsection could actually be underestimating the wealth effects we try to measure, we also estimate the effect of the initial distress on the price of non-bankrupt partners. To identify pre-filing distress dates, we use the approach of Hertzler, Li, Officer, and Rogers (2008). In the year prior to the bankruptcy filing, we identify the date with the largest negative abnormal return of the filing firm and use it as the distress date.¹

Table 3 presents the results for the wealth effects around distress announcement dates. We do not find any significant effect for the full sample and the sub-samples of strategic alliances and JVs. When we separate alliances into longer-term and shorter-term,

¹ We also examine news announcements in the year prior to the bankruptcy announcements and try to identify the first time a bankruptcy possibility is mentioned. Using these dates, we repeat the wealth effect analysis, but do not find any significant results.

we find that the former are associated with more negative effects than the latter, but only for CAR(-1,+1). Long-term alliance partners suffer on average a 0.73% decline in market value on the distress date, which is statistically significant at the 10% level.

Next we examine whether the presence of equity stakes and board memberships of strategic alliance partners affects the size of the wealth effects. Ownership stakes and board presence might signify the importance of the alliance to the parties. Thus, we expect that alliance members holding equity in or sitting on the board of other alliance members may suffer more if those members go bankrupt. We collect information on equity holdings and board membership from annual proxy statements. Consistent with other studies on strategic alliances (see, for example, Fee, Hadlock, and Thomas (2006)) we find equity ownership and/or board membership is not that common in alliances. Only 30 of our sample alliances include equity and/or board presence by both the non-bankrupt party in the bankrupt party, and vice versa.

The wealth effects associated with this subsample are presented in Table 4. Caution is due in interpreting some of the results, however, because of the small sample size. Nevertheless, we find that alliances with ownership and board membership have statistically negative and significant CARs on bankruptcy announcement dates. JVs, on the other hand, tend to experience positive CARs, although those are not significant. When we further divide the subsample according to the alliance duration, but do not find any significant results, potentially due to the small sample size. Thus, the results in Table 4 provide some evidence that alliance partners holding equity stakes and sitting on the boards of their alliance counterparts suffer wealth losses when a bankruptcy is announced.

IV.B. Horizontal versus vertical alliances

Another important alliance characteristic that could impact the wealth effects of bankruptcy announcements is the degree to which alliance partners compete with each other. Generally, alliances and joint ventures could be classified as horizontal or vertical. Alliances including partners that operate in the same lines of business are called horizontal alliances. The partners benefit from economies of scale in production and distribution and from increased market power. Alliances including firms from different stages of the production chain are called vertical alliances. In those alliances, the partners usually enjoy cost savings from transportation, inventory, etc.

Recent studies have documented that horizontal JVs create value while vertical JVs do not (see Johnson and Houston (2000) and Slovin, Sushka, and Mantecon (2007)). Based on these findings we conjecture that alliance partners in horizontal alliances are likely to suffer more serious consequences. To test this conjecture, we divide our sample into horizontal and vertical alliances based on the 2-digit SIC codes of the participating partners. If two alliance partners have the same 2-digit SIC then this is considered a horizontal alliance, and vice versa. Panel A of Table 5 presents the results. We find that horizontal alliances suffer larger wealth effects from the bankruptcy of an alliance partner. The CAR(-1,1) of horizontal ventures is negative and significant, while that of vertical alliances is not. However, with respect to long-term alliances we find that partners from both horizontal and vertical alliances suffer significant negative returns upon the announcement of a bankruptcy. This result supports our earlier finding that long-term alliance partners tend to suffer larger consequences than short-term alliance partners.

IV.C. Low R&D firms versus High R&D

We next turn our attention to companies from areas that are likely to have specialized assets and potential contractual problems and ask the question: Do such companies suffer more when an alliance partner goes bankrupt? For example, Allen and Philips (2000) document that companies operating in high R&D industries benefit the most from alliances with other corporations. Therefore, one might expect that these firms would face larger negative effects than other firms should an alliance partner go bankrupt. To test for such effects, we divide the sample into high R&D and low R&D firms. We define a high R&D firm to be a firm whose R&D/Total Assets ratio is higher than the median R&D/Total Assets ratio across industries for the year of bankruptcy announcement.

The results from the analysis are presented in Panel B of Table 5. Both high and low R&D firms experience negative CARs, but the wealth effects do not appear to be stronger for the former compared to the latter. In fact, the CAR(-1,1) for alliance partners that are high R&D firms is -0.52% which is not statistically significant, while CAR(-1,1) for alliance partners that are low R&D firms is -0.71%, which is significant at the 10% level. Like in the previous sub-sections, we find that the effect of an alliance partner's bankruptcy announcement is especially strong for long-term alliances. Similarly, we find no effect for JVs.

IV.D. Liquid versus financially constrained firms

Lastly, we examine the bankruptcy announcement effects for liquid versus constrained alliance partners. One of the main benefits of strategic alliances and JVs is that they alleviate financing constraints of alliance partners. Thus, losing a partner due to bankruptcy might have a significant negative effect on a financially constrained partner.

Following Allen and Philips (2000), we define financially-constrained firms as those whose cash and after-tax operating cash flows are smaller than their investments in the year prior to the bankruptcy announcement.

Panel C of Table 5 presents the CARs for constrained and liquid firms. We find that both constrained and liquid firms experience a significant negative wealth effect at the announcement of a bankruptcy of an alliance partner. However, the announcement effect appears to be much stronger for constrained alliance partners. The size of constrained firms' CARs is almost twice the size of the CARs of the liquid firms, although tests for equality of medians show no statistically significant differences. We again document that long-term alliance partners exhibit the largest negative wealth effects. As before, we find no effect for JVs.

IV.E. Multivariate Regressions

So far our analysis has focused on univariate tests. It is possible, however, that the differences that we document in the previous subsections are driven by firm-specific and alliance-specific characteristics for which currently we do not control. In this subsection we use an OLS regression of bankruptcy announcement CARs on a host of control variables.

In addition to proxies for high R&D, liquidity, and dummy variables for JVs and horizontal vs. vertical alliances, we employ several other control variables. First, given the importance of alliance duration, we use a dummy variable (*Duration*) indicating whether the alliance is a long-term one (it has been in existence for more than 4 years) or short-one. Second, we also use another measure to quantify the size of the benefits for the partners in the alliance. To accomplish this, we use the stock price reaction of the alliance

partners on the alliance announcement day. We estimate the alliance announcement CAR(-1,+1) for each alliance partner and multiply it by the market value of that partner at the end of the month immediately preceding to the announcement day. This gives us the dollar value of the market reaction. This variable, which we call *Market reaction*, is used as in the OLS regression. Third, we also use a dummy variable if the healthy partner and the bankrupt partner share a common venture capitalist (VC).

Table 6 presents the coefficient estimates from the OLS regression. In Model 1 we include all variables that we use in the univariate analysis. Consistent with our univariate results, the wealth impact is negative and stronger for long-term alliances. None of the other control variables are significant. In Model 2 we include the market reaction variable and the VC dummy. The coefficient on *Market reaction* is positive and significant at the 10% significance level. This suggests that alliance partners in alliances that were considered beneficial by the market when they commenced experience less negative wealth effect when bankruptcy is announced. However, when we interact *Market Reaction* with *Duration* the coefficient on the interaction term is negative and significant at the 5% level. Thus, it appears that while a partner in a high-benefit (in terms of dollar value) alliance experiences less negative wealth effect associated with the bankruptcy announcement, the combination of long-term and high dollar value alliance results in a significant loss of on the bankruptcy announcement date. We find similar results when we use CAR(-2,+2).

By and large, our results remain intact when we use a multiple regression. Healthy partners in long-term and high dollar value alliances experience significantly negative wealth effects when a partner announces bankruptcy. This supports our

argument that despite the unquestionable benefits, alliances could also create negative effects on participating partners.

V. Effect of Partner Bankruptcy on the Operating Performance of Non-Bankrupt Alliance Partners

Lastly, we investigate the changes in the operating performance and financial policies of non-bankrupt partners following the bankruptcy announcement of an alliance partner. We are primarily interested in how their cost structure, sales growth, investments, and borrowings change as a result of a partner's bankruptcy. We use information from Compustat to calculate sales growth (changes in item 12), profit margin (item 13 / item 12), investments (item 46 + item 128 / item 6), current ratio (data 4 / data 5), quick ratio ((data 4 – data 3) / data 5), and debt (data 9 / data 6).

We execute the operating performance analysis using a difference-in-difference approach. For each sample firm, we select a matching firm that is from the same industry, is of similar size, and has similar profitability. Barber and Lyon (1996) and Lie (2001) show that it is important to control for past profitability in order to obtain well-specified test statistics in operating performance studies. Industry classification is based on SIC codes. We match on 4-digit and 3-digit SICs. If there are not enough matches, we rely on 2-digit and 1-digit SICs. Size is measured as the sales in the year prior to the bankruptcy announcement. We require that the size of each matching firm is within 50%-150% of the size of our sample firm. We also require that there are at least 5 firms within that size group. Lastly, from the firms with similar size we select the one with the closest past performance, where performance is measured by the firm's ROA.

We follow the performance of our sample firms relative to that of their matching group in the three years after the bankruptcy announcement. Every year, the matching firm-adjusted performance is compared to that in the year before the bankruptcy announcement. If a matching firm drops out, we splice the next closest matching firm. The results are listed in Table 7. We document that strategic alliance partners, but not JVs, experience lower profit margins and investment levels in the first and second year after the bankruptcy announcement. The results are stronger for longer-term alliances. While by year 3 investments recover to their pre-bankruptcy levels, profit margins tend to remain significantly lower in the three years after the bankruptcy announcement. In addition, by year 3, strategic alliance partners have higher current and quick ratios than the pre-bankruptcy year. We do not detect any differences regarding sales growth and debt levels.

VI. Conclusion

While prior research has documented the benefits of engaging in strategic alliances and joint ventures, we show that these arrangements can have a downside by exposing firms to counter-party financial distress risk. In particular, we examine what happens to the financial and operational performance of one partner when the other one files for bankruptcy.

Using stock return analysis, we find that the bankruptcy announcement is a significantly negative event for the non-bankrupt partner of strategic alliances, but there is not a significant wealth impact for joint venture partners. Using the length of the

agreement as a proxy for the importance of the relationship, further tests show that the negative effect is concentrated among the older strategic alliance agreements.

Following the bankruptcy filing, we examine several dimensions of performance and investment for non-bankrupt partner. The partner firms do tend to experience lower profit margins and investment in the years after the bankruptcy, which indicates that the agreement had a significant impact on operations.

Overall, our results lend further evidence that strategic alliances lead to benefits, but that the loss of those benefits when one party files for bankruptcy can lead to a reduction of shareholder wealth and worsening performance for the non-bankrupt party. The more formal structure of joint ventures appears to insulate the counter-party from the bankruptcy process since the joint venture assets would be more protected.

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Table 1. Summary statistics

The table presents summary statistics for the sample of bankrupt firms involved in a strategic alliance or joint venture from 1989-2007. Panel A breaks down the sample by type of agreement – either strategic alliance or joint venture. Panel B shows the distribution of the sample by the year that one of the alliance or joint venture partners filed for bankruptcy. Panel C shows the industry distribution of the non-bankrupt alliance partners. Industry affiliation is determined by two-digit SIC code.

Panel A. Bankruptcies by type of alliance

Number of bankruptcies	130
Number of strategic alliances	366
Number of joint ventures	84
Number of non-bankrupt alliance partners	288
Unique non-bankrupt alliance partner-bankruptcy combinations	427

Panel B. Annual distribution of sample bankruptcies

Year	Number of bankruptcies
1989	1
1990	1
1991	4
1992	4
1993	4
1994	3
1995	4
1996	5
1997	4
1998	8
1999	9
2000	6
2001	25
2002	21
2003	16
2004	5
2005	6
2006	2
2007	2

Panel C. Industry distribution of alliance partners

	Two-digit SIC	Frequency	Percent
BUSINESS SERVICES	73	53	14.25
TELECOMMUNICATIONS	48	46	12.37
ELECTRONIC & OTHER ELECTRIC EQUIPMENT	36	39	10.48
INDUSTRIAL MACHINERY & EQUIPMENT	35	35	9.41
ELECTRIC, GAS & SANITARY SERVICES	49	23	6.18
CHEMICALS AND ALLIED PRODUCTS	28	20	5.38
TRANSPORTATION EQUIPMENT	37	18	4.84
TRANSPORTATION BY AIR	45	10	2.69
FOOD AND KINDRED PRODUCTS	20	8	2.15
PRIMARY METAL INDUSTRIES	33	8	2.15
INSTRUMENTS & RELATED PRODUCTS	38	8	2.15
WHOLESALE TRADE-DURABLE GOODS	50	8	2.15
GENERAL MERCHANDISE STORES	53	7	1.88
APPAREL & OTHER TEXTILE PRODUCTS	23	6	1.61
HOLDING & OTHER INVESTMENT OFFICES	67	6	1.61
PRINTING AND PUBLISHING	27	5	1.34
PETROLEUM AND COAL PRODUCTS	29	5	1.34
TRANSPORTATION SERVICES	47	4	1.08
WHOLESALE TRADE-NONDURABLE GOODS	51	4	1.08
FOOD STORES	54	4	1.08
MISCELLANEOUS RETAIL	59	4	1.08
ENGINEERING & MANAGEMENT SERVICES	87	4	1.08
ALL OTHER	n/a	47	12.69
TOTAL		372	100.00

Table 2. Wealth effects around bankruptcy announcement dates to partner firms

The table presents mean cumulative abnormal returns for the non-bankrupt firm when its strategic alliance or joint venture partner files for bankruptcy. Day 0 is the bankruptcy announcement date. Duration is measured as the number of years that the two firms have been involved in an agreement. T-values are presented in parentheses.

	CAR (-1,+1)	CAR (-2,+2)	Num. Obs.
<i>All Agreements</i>			
Full sample	-0.39% (-1.79)	-0.44% (-1.61)	427
Alliances	-0.60% (-2.42)	-0.41% (-1.27)	308
JVs	0.16% (0.36)	-0.54% (-0.99)	119
<i>Alliance duration > 4 yrs</i>			
Full sample	-0.94% (-2.86)	-0.93% (-2.66)	191
Alliances	-1.12% (-3.24)	-0.83% (-1.97)	140
JVs	-0.01% (-0.12)	-1.20% (-1.93)	51
<i>Alliance duration < 4 yrs</i>			
Full sample	0.12% (0.33)	-0.11 (-0.24)	194
Alliances	-0.007 (-0.02)	-0.02 (-0.31)	135
JVs	0.40% (0.55)	0.003% (0.01)	59

Table 3. Wealth effects around pre-filing distress dates to partner firms

The table presents the mean cumulative abnormal returns for the non-bankrupt firm when its alliance or joint venture partner files for bankruptcy. Day 0 is the distress date. The distress dates are identified using the approach of Hertz et al. (2008) – it is the day with the largest drop in abnormal returns in the year prior to the bankruptcy announcement. Duration is measured as the number of years that the two firms have been involved in an agreement. T-values are presented in parentheses.

	CAR (-1,+1)	CAR (-2,+2)	Num. Obs.
<i>All Agreements</i>			
Full sample	0.41% (0.66)	0.47% (0.69)	427
Alliances	0.34% (0.41)	0.52% (0.57)	308
JVs	0.60% (1.33)	0.34% (0.53)	119
<i>Alliance duration > 4 yrs</i>			
Full sample	-0.67% (-2.05)	-0.62% (-1.44)	179
Alliances	-0.73% (-1.79)	-0.57% (-1.09)	134
JVs	-0.49% (-0.03)	-0.77% (-1.05)	45
<i>Alliance duration < 4 yrs</i>			
Full sample	1.49% (1.10)	1.68 (1.16)	190
Alliances	1.59 (0.85)	1.95 (0.98)	135
JVs	1.25% (1.56)	1.03% (0.88)	55

Table 4. Wealth effects around bankruptcy announcement dates – equity ownership and board membership

This table presents the mean cumulative abnormal returns for the non-bankrupt firm when its alliance or joint venture partner files for bankruptcy. Included in the analysis are only alliances involving board memberships and/or equity ownership of a non-bankrupt partner in a bankrupt partner, or vice versa. Day 0 is the bankruptcy announcement date. Duration is measured as the number of years that the two firms have been involved in an agreement. T-values are presented in parentheses.

	CAR (-1,+1)	CAR (-2,+2)	Num. Obs.
<i>All Agreements</i>			
Full sample	-0.91% (-1.30)	0.12% (0.15)	30
Alliances	-1.55% (-1.82)	-0.29% (-0.28)	23
JVs	0.118% (1.66)	1.48% (1.65)	7
<i>Alliance duration > 4 yrs</i>			
Full sample	-0.86% (-0.89)	0.46% (0.53)	16
Alliances	-1.93% (-1.57)	-0.29% (-0.27)	11
JVs	1.50% (1.55)	2.11% (1.84)	5
<i>Alliance duration < 4 yrs</i>			
Full sample	-2.22% (-1.62)	-1.68 (-0.72)	7
Alliances	-2.54 (-1.61)	-1.90 (-0.69)	6

Table 5. Wealth effects around bankruptcy announcement dates –vertical vs. horizontal agreements, high R&D, and financial constraints

The table presents the mean cumulative abnormal returns for the non-bankrupt firm when its alliance or joint venture partner files for bankruptcy. Day 0 is the bankruptcy announcement date. Duration is measured as the number of years that the two firms have been involved in an agreement. Panel A examines horizontal and vertical agreements. Horizontal agreements are defined as the partner firms operating in the same 2-digit SIC code and Vertical agreements are classified as when the firms do not operate in the same 2-digit SIC code. Panel B examines high R&D versus low R&D firms. High R&D firms have a R&D/Total Assets ratio that is higher than the median R&D/Total Assets ratio across industries for the year of bankruptcy announcement. Panel C contains analysis on liquid versus constrained firms. Financially-constrained firms are those with cash and after-tax operating cash flows are smaller than their investments in the year prior to the bankruptcy announcement. T-values are presented in parentheses.

Panel A. Horizontal vs. Vertical Agreements

	CAR (-1,+1)	CAR (-2,+2)	Num. Obs.
<i>Horizontal Agreements</i>			
Full sample	-0.54% (-1.15)	-0.001% (-0.01)	119
Alliances	-1.10% (-2.15)	-0.10% (-0.14)	92
JVs	1.37% (1.25)	0.32% (0.24)	27
Alliance duration > 4 yrs	-1.30% (-2.12)	-0.16% (-0.24)	37
Alliance duration < 4 yrs	-0.47% (-0.46)	0.025% (0.16)	37
<i>Vertical Agreements</i>			
Full sample	-0.33% (-1.38)	-0.61% (-2.11)	308
Alliances	-0.39% (-1.39)	-0.54% (-1.62)	216
JVs	-0.19% (-0.42)	-0.79% (-1.35)	92
Alliance duration > 4 yrs	-1.10% (-2.54)	-1.10% (-2.05)	103
Alliance duration < 4 yrs	0.17% (0.42)	-0.32% (-0.72)	98

Table 5, continued

Panel B. High R&D vs. Low R&D Firms

	CAR (-1,+1)	CAR (-2,+2)	Num. Obs.
<i>High R&D alliance partners</i>			
Full sample	-0.34% (-1.13)	-0.43% (-1.18)	226
Alliances	-0.52% (-1.52)	-0.39% (-0.90)	172
JVs	0.24% (0.41)	-0.54% (-0.83)	54
Alliance duration > 4 yrs	-0.95% (-2.34)	-0.45% (-0.94)	90
Alliance duration < 4 yrs	-0.04% (0.06)	-0.46% (-0.51)	65
<i>Low R&D alliance partners</i>			
Full sample	-0.45% (-1.41)	-0.46% (-1.09)	201
Alliances	-0.71% (-1.96)	-0.43% (-0.89)	136
JVs	-0.009% (-0.14)	-0.53% (-0.63)	65
Alliance duration > 4 yrs	-1.43% (-2.23)	-1.51% (-1.88)	50
Alliance duration < 4 yrs	0.02% (0.05)	0.11% (0.17)	70

Table 5, continued

Panel C. Liquid vs. Financially Constrained Firms

	CAR (-1,+1)	CAR (-2,+2)	Num. Obs.
<i>Constrained firms</i>			
Full sample	-0.73% (-1.37)	-0.57% (-0.77)	114
Alliances	-0.93% (-1.78)	-0.27% (-0.33)	85
JVs	-0.13% (-0.09)	-1.46% (-0.84)	29
Alliance duration > 4 yrs	-1.99% (-2.58)	-0.60% (-0.61)	29
Alliance duration < 4 yrs	-0.01% (-0.02)	-0.17% (-0.31)	135
<i>Liquid firms</i>			
Full sample	-0.27% (-1.19)	-0.40% (-1.51)	313
Alliances	-0.48% (-1.70)	-0.46% (-1.44)	223
JVs	0.25% (0.71)	-0.24% (-0.53)	90
Alliance duration > 4 yrs	-0.89% (-2.32)	-0.88% (-1.91)	111
Alliance duration < 4 yrs	-0.04% (-0.09)	-0.29% (-0.59)	92

Table 6. Regression of bankruptcy announcement CARs on various control variables

The table presents an OLS regression of bankruptcy announcement CARs on a set of control variables. Day 0 is the bankruptcy announcement date. Duration is a dummy variable equal to 1 if the alliance duration is greater than 4 years and zero otherwise. Market reaction is (Abnormal return on alliance announcement (-1,+1))*(Company market value at the end of the month prior to the alliance announcement). Horizontal alliance occurs when the 2-digit SIC code of the alliance partner and the bankrupt partner are the same. Common VC is a dummy equal to 1 if the alliance partner and the bankrupt partner had the same VC backer. Robust *t*-statistics is reported in the brackets. *, **, *** denote significance at 10%, 5%, and 1% level, respectively.

	Dependent variable:			
	CAR (-1,+1)	CAR (-1,+1)	CAR (-1,+1)	CAR (-2,+2)
Constant	-0.0041 (-1.14)	-0.0043 (-1.19)	-0.0045 (-1.25)	-0.0037 (-0.77)
Duration	-0.0085 (-1.97)	-0.0085 (-1.96)	-0.0081 (-1.86)	-0.0081 (-1.50)
Market reaction		0.00001 (1.75)	0.00002 (2.76)	0.00002 (1.69)
Duration*Market reaction			-0.00003 (-2.52)	-0.00004 (-2.39)
JVs	0.0077 (1.54)	0.0077 (1.54)	0.0079 (1.57)	-0.0005 (-0.08)
Horizontal alliance	-0.0016 (-0.30)	-0.0018 (-0.34)	-0.0022 (-0.43)	0.0051 (0.73)
High R&D firm	0.0037 (0.86)	0.0038 (0.88)	0.0042 (0.97)	0.0027 (0.49)
Liquid firms	0.0002 (1.03)	0.0002 (0.84)	0.0002 (0.86)	-0.00002 (-0.19)
Common VC		-0.0031 (-0.13)	-0.0025 (-0.10)	-0.0033 (-0.10)
Adjusted R-squared	1.75%	2.13%	2.48%	1.34%

Table 7. Operating performance following bankruptcy announcements of alliance partners – a difference-in-difference approach

The table presents the matching firm-adjusted measures of operating performance for non-bankruptcy alliance partners. We calculate the (Post – Pre) difference of each measure as the difference between the post-bankruptcy and pre-bankruptcy value of the measure. We peer-adjust the (Post – Pre) difference by subtracting the (Post – Pre) value of the corresponding matching firms. Matching firms are the closest firms to each sample firm by industry, size (50%-150% of sales) and past performance (measured as ROA in the year prior to bankruptcy announcement). Year 0 is the year of bankruptcy announcement. Mean and Median denote the mean and median of this matching firm-adjusted difference. We report in parenthesis the p-values of *t*-tests for the means and Wilcoxon signed rank tests for the medians equaling zero.

Panel A. Year +1

	#Obs.	Sales growth		Profit Margin		Investments		Current Ratio		Quick ratio		Debt	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Full sample	349	0.0310 (0.39)	0.0011 (0.61)	-0.0093 (0.55)	-0.0056 (0.11)	-0.0028 (0.65)	-0.0021 (0.08)	0.0113 (0.90)	0.0200 (0.30)	0.0136 (0.86)	0.0058 (0.42)	-0.0026 (0.72)	-0.0018 (0.53)
Strategic alliances only	245	0.0315 (0.39)	0.0013 (0.40)	-0.0085 (0.52)	-0.0094 (0.02)	-0.0065 (0.34)	-0.0039 (0.03)	0.0076 (0.95)	0.0369 (0.31)	-0.0006 (0.99)	0.0084 (0.56)	-0.0057 (0.49)	0.0000 (0.88)
Alliance duration > 4 yrs	100	0.0282 (0.65)	-0.0003 (0.51)	0.0006 (0.97)	-0.0158 (0.04)	-0.0163 (0.09)	-0.0036 (0.09)	0.0796 (0.68)	0.0870 (0.11)	0.1048 (0.53)	0.0565 (0.14)	0.0045 (0.70)	0.0000 (0.84)
Alliance duration < 4 yrs	115	-0.0118 (0.79)	-0.0041 (0.74)	-0.0213 (0.35)	-0.0056 (0.18)	0.0033 (0.77)	-0.0040 (0.35)	-0.0827 (0.64)	-0.0169 (0.75)	-0.1129 (0.45)	-0.0398 (0.53)	-0.0089 (0.49)	0.0006 (0.86)
Joint ventures only	104	0.0298 (0.72)	-0.0155 (0.81)	-0.0113 (0.79)	0.0002 (0.41)	0.0060 (0.65)	0.0023 (0.55)	0.0211 (0.83)	-0.0121 (0.76)	0.0518 (0.58)	-0.0157 (0.53)	0.0048 (0.75)	0.0069 (0.20)

Panel B. Year +2

	#Obs.	Sales growth		Profit Margin		Investments		Current Ratio		Quick ratio		Debt	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Full sample	317	0.0663 (0.08)	0.0212 (0.07)	-0.1107 (0.39)	-0.0010 (0.54)	-0.0051 (0.28)	-0.00002 (0.22)	0.0599 (0.59)	0.0229 (0.37)	0.0564 (0.57)	0.0095 (0.56)	0.0084 (0.38)	0.0039 (0.21)
Strategic alliances only	217	0.0559 (0.15)	0.0207 (0.05)	0.0248 (0.22)	-0.0057 (0.41)	-0.0105 (0.08)	-0.0029 (0.05)	0.0556 (0.70)	0.0323 (0.55)	0.0347 (0.79)	0.0191 (0.83)	0.0159 (0.19)	0.0015 (0.17)
Alliance duration > 4 yrs	92	0.0282 (0.65)	-0.0003 (0.51)	0.0116 (0.66)	-0.0118 (0.06)	-0.0141 (0.18)	-0.0108 (0.04)	0.2781 (0.22)	0.0413 (0.26)	0.3045 (0.14)	0.0321 (0.49)	0.0296 (0.17)	0.0004 (0.52)
Alliance duration < 4 yrs	100	0.0699 (0.18)	0.0335 (0.21)	0.0394 (0.28)	0.0016 (0.37)	-0.0074 (0.36)	0.0030 (0.74)	-0.1389 (0.55)	0.0028 (0.71)	-0.2065 (0.30)	-0.0198 (0.61)	-0.0075 (0.61)	0.0021 (0.20)
Joint ventures only	100	0.0893 (0.28)	0.0218 (0.78)	-0.4051 (0.32)	0.0028 (0.88)	0.0063 (0.42)	0.0049 (0.42)	0.0704 (0.60)	-0.0024 (0.52)	0.1109 (0.39)	-0.0047 (0.54)	-0.0078 (0.61)	0.0058 (0.76)

Panel C. Year +3

	#Obs.	Sales growth		Profit Margin		Investments		Current Ratio		Quick ratio		Debt	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Full sample	294	0.0153 (0.67)	-0.0070 (0.77)	-0.0021 (0.96)	0.0029 (0.46)	-0.0075 (0.24)	0.0029 (0.94)	0.2927 (0.04)	0.0567 (0.09)	0.2745 (0.04)	0.0501 (0.04)	0.0023 (0.83)	0.0097 (0.63)
Strategic alliances only	203	-0.0115 (0.78)	-0.0070 (0.55)	-0.0388 (0.37)	-0.0018 (0.76)	-0.0132 (0.13)	-0.0011 (0.27)	0.3428 (0.06)	0.0743 (0.12)	0.3100 (0.07)	0.0623 (0.06)	0.0081 (0.53)	0.0144 (0.45)
Alliance duration > 4 yrs	87	-0.0106 (0.86)	0.0077 (0.67)	-0.0175 (0.36)	-0.0114 (0.02)	-0.0216 (0.19)	-0.0041 (0.27)	0.3860 (0.10)	0.0634 (0.23)	0.3769 (0.10)	0.1354 (0.22)	0.0210 (0.16)	0.0205 (0.33)
Alliance duration < 4 yrs	97	-0.0238 (0.70)	-0.0296 (0.18)	0.0933 (0.30)	0.0109 (0.13)	-0.0054 (0.60)	0.0029 (0.93)	0.3650 (0.25)	0.0573 (0.41)	0.2959 (0.31)	0.0453 (0.25)	0.0026 (0.91)	0.0144 (0.78)
Joint ventures only	91	0.0771 (0.27)	-0.0232 (0.65)	-0.0922 (0.41)	0.0066 (0.08)	0.0049 (0.52)	0.0090 (0.11)	0.1653 (0.36)	0.0308 (0.52)	0.1820 (0.28)	0.0101 (0.51)	-0.0108 (0.53)	0.0066 (0.69)