A RE-EXAMINATION OF VALUE-CREATION THROUGH STRATEGIC ALLIANCES

Uri Ben-Zion, Koresh Galil,
Mosi Rosenboim and Hadas Shabtay

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Monaster Center for
Economic Research
Ben-Gurion University of the Negev
P.O. Box 653
Beer Sheva, Israel

Fax: 972-8-6472941
Tel: 972-8-6472286

A re-examination of value-creation through strategic alliances

Uri Ben-Zion, Koresh Galil, Mosi Rosenboim, Hadas Shabtay[1]

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Abstract

This paper uses a sample of 335 firms participating in strategic alliances in order to re-examine the value creation through strategic alliances. We show that the immediate positive response of stock markets to new strategic alliances is followed by negative abnormal returns. Twenty days after announcements, cumulative positive abnormal return is only evident for the firms with the highest stock market's response to the announcement. We relate the positive abnormal returns reported in previous research to the presence of short-run over-reaction in stock markets and conclude in the market's ability to identify the more valuable alliances.

Keywords: Strategic alliance; over-reaction; momentum.

JEL classification: L22, G32, D23

[1] Ben-Zion and Galil, are from Ben-Gurion University. Rosenboim is from the Ben-Gurion University and Sapir College and Shabtay is from Tel-Aviv University. Email for correspondence – galilk@bgu.ac.il

1. Introduction

Compared to other types of cooperation between firms, strategic alliances seem to be less demanding. Alliances are often created without any exchange of shares or capital investment. Firms agree to share knowledge, or to cooperate in development, production or marketing of products with a low level of commitment. The lack of commitment may reduce different type of risk. Firms suspecting that cooperation might not be successful, can use this type of cooperation in order to test the potential of the cooperation without risking control over their unique knowledge, product or market stance. If the firms involved in the alliance are themselves skeptical, why shouldn't the investors be skeptical too? If strategic alliances create value, why wouldn't firms engage in artificial alliances simply in order to deceive the market and elevate their value?

Many studies have tried to test value creation through strategic alliances that do not involve exchange of shares or capital investment. Chan et al. (1997) used event study methodology to examine stock price responses to non-equity alliance announcements. Their sample consisted of 345 strategic alliances announced between 1983 -1992. They found, on average, a significant positive abnormal return (0.64%) on the announcement day. McConnell and Nantell (1985); Koh and Venkataraman,(1991); Woolridge and Snow (1990); Robinson and Stuart (2000); Johnson and Houston (2000); Neill et al. (2001) and Socher (2004) have discovered similar results. However the cumulative abnormal return in these studies was calculated up to five to six days after the announcement, and no test was carried out to examine the persistence of the created value beyond the announcement period.

Over-reaction and under-reaction of stock markets is prevalent. DeBondt and Thaler (1985) were among the first to document long-term (three to five years) reversal in stock returns; winner firms tend to be future losers, and vice versa. They attributed this phenomenon of over-reaction to the behavioral decision theory of Kahneman and Tversky (1982). The poor post-event returns of initial public offerings documented by Ritter (1991), and later on by others, can also be treated as an over-reaction phenomenon.

On the other hand, it seems that markets also tend to under-react. Ball and Brown (1968) were the first to show that stock prices respond to earnings about a year after they are announced. Short-term momentum in stock returns was first identified by

Jagadeesh and Titman (1993) that showed winners are to be future short-term winners and losers to be short-term losers. This phenomenon can also be classified as a symptom of under-reaction.

These phenomena of over-reaction and under-reaction can blur the real value of events in the context of event-study methodology. In this study we carry out an event-study similar to those of previous studies (such as Chan et al. (1997) and Woolridge and Snow (1990)) and simply refine it by prolonging the post-event window to 20 days after the announcement day. Hence, we are able to control for possible short-term anomalies (over-reaction and under-reaction).

The sample used is of 335 firms (including 66 duplicates) traded in the US and participating in 289 strategic alliances throughout the years 1990-1997. As in previous studies, a market model is used for measuring abnormal returns. Characteristics of firms are collected from public announcements and the COMPUTAT database. Daily returns are taken from CRSP.

The estimation reveals that, as in previous studies, participating firms exhibit positive and statistically significant abnormal returns during the 3-day period surrounding the announcement day. The abnormal returns are also higher for alliances involving capital investments. Focusing on alliances that do not involve capital investments, we report several interesting results. Over-reaction dominates the short-run results. Positive abnormal returns are followed by statistically significant and negative abnormal return on a scale such that the cumulative abnormal return up to 20 days after the announcement is non-positive and statistically insignificant. Focusing on firms without negative pre-event abnormal returns reveals that the observed reversal in returns is not due to momentum effect.

Though on average strategic alliances do not create value, one cannot reject the possibility that some alliances do. The positive abnormal return of firms with the highest positive immediate response persists at least 20 days after the announcement day. We relate this finding to the market's ability to identify the more valuable alliances.

Several tests are carried out in order to identify the characteristics of firms and alliances with positive abnormal returns. Out of these characteristics, high-tech firms, small firms and firms in alliances aiming at the current markets of the participants, exhibit higher positive abnormal returns during the event window. While this is theoretically expected and was also observed in previous studies, we also show that

these positive abnormal returns might also be a product of over-reaction. We conclude that additional characteristics are used by market players in assessing the value added of strategic alliances.

The rest of the paper is organized as following. Section 2 summarizes related literature and presents the research hypotheses. A description of the database and the methodology is presented in section 3. Section 4 presents the results and section 5 concludes.

2. Related Literature and Research Hypotheses

Earlier studies acknowledge a positive and significant average return surrounding the announcement date of the alliance. Chan et al. (1997) and Neill et al. (2001) used event study methodology to examine stock price responses to non-equity alliance announcements. The sample of Chan et al. (1997) consisted of 345 non-equity alliances announced in the USA from 1983 to 1992. The sample of Neill et al. (2001) consisted of 89 non-equity alliances announced in the USA from 1987 to 1994. They both discovered a significant positive stock price response. Similar results were discovered by McConnell and Nantell, 1985; Koh and Venkataraman, 1991; Woolridge and Snow, 1990; Robinson and Stuart, 2000; Johnson and Houston, 2000; Socher, 2004).

Some of the earlier studies attempted to find common factors among the firms which may explain the positive stock market reaction. The possible reasons relate either to a characteristic of the firms involved in the alliance or to a characteristic of the alliance itself.

The type of the alliance is an example of such an alliance characteristic. Promotional alliances are one type of alliance. Such an alliance is basically an advertising and promotion contract combined with a long-run relationship. The main benefit of a promotional alliance is that it increases consumer awareness about the firm's products and services.

A technological alliance is another type of alliance and it appeared to be of a greater value. Liu (2004) examined the stock market reactions to U.S biotech innovation news announcements from 1983 to 1993. He found positive abnormal returns during the announcement period. He also found post-announcement abnormal returns that were positively related to a firm's technology depth. Das et al (1998) examined 119

strategic alliances formed from 1987 to 1991. They found that the capital markets appear to be indifferent to announcements of strategic alliances. Nevertheless, having divided their sample by alliance type, they found that technological alliances enjoyed greater abnormal returns than marketing alliances. These findings were supported by Hagedoorn and Schakenraad (1994) and by Chan et al. (1997).

Another interesting finding is that the smaller partners in technological alliances appeared to benefit the most. Chung et al (2006) supported those findings. They proposed a framework to study the efficiency of alliances between small firms in the knowledge industry. They claimed that the benefits from forming an alliance are pronounced for small firms, as they specialize in a certain niche, which tends to be in demand regardless of the size of the partnering firms. Hoffman and Schlosser (2001) and Bar-Nir and Smith (2002) claimed that small firms creating alliances are provided with access to external resources and market opportunities. For large firms, the alliance with small firms provides the specialized expertise necessary to round off their capabilities and experience.

Parkhe (1993) dealt with national and multinational alliances. He compared alliances among US firms only to alliances involving a single US and a single non-US firm. He found fundamental differences between the two groups. His findings are explained by Kluckhohn and Kroeberg (1952), Beamish (1985), Geringer and Hebert (1991) and Harrigan (1985), claiming that multinational alliances bring together people who may have different patterns of behaving and believing. An example can be found in the partners' approaches to conflict resolution. In some cultures (e.g., Europe, US), conflict is viewed as a healthy and an inevitable part of relationships, while in other cultures (e.g., Japan, South Korea, the Middle East), conflict and open confrontation are deemed distasteful. Parkhe (1993) found that such fundamental differences create significant differences in the structuring and ongoing management of alliances. Such differences are not costless; hence, such international alliances are expected to be more volatile and less successful. The findings of Garrette and Dussauge (1995) support that assumption. They examined 63 international aerospace and defense industry alliances over the period 1950-1990. They found that the industry tends not to concentrate on an international level because of political constraints. Instead, they found that over the years, the industry has increasingly been moving towards establishing semi-structured organizations to manage multinational joint projects.

Thus, firms manage to gain a size advantage in global markets while maintaining autonomous decision-making centers at the country level.

Another interesting finding of Garrette and Dussauge (1995) deals with the goal of the alliance. Hennart (1988) and Kogut (1988) defined complementary (or link) alliances as those aiming to globalize a product in a multi-domestic setting by benefiting from the complementarities that exist between the partner firms. For instance, one partner promotes the other partner's products in a domestic market. Scale alliances are set up to deal with the increasing globalization of markets and customers. Therefore, they mutually develop, manufacture and market common products. The partners choose to unite in order to pool resources rather than to profit from any complementarities.

Another crucial issue deals with the stability and length of alliances. Williamson (1985) considered strategic alliances as "unstable, with a tendency to evolve into more stable organizational forms". Franko (1971) and (Kogut) 1988 claimed that many alliances characterized by a high degree of flexibility, a low level of irreversible commitment, and incomplete contracts are unsuitable for carrying out long-term projects. Therefore we would expect long-term alliances to be less stable, and hence less profitable and more likely to fail.

Das and Teng (1998;2000) reinforce this assumption. They offer a qualitative approach presenting the obstacles which may lead to termination of alliances. Though alliances depend on a great number of factors, the tension in short-term versus long-term orientation is a critical one. A long-term orientation provides the commitment needed for a good working relationship, whereas a short-term orientation stresses prompt results. They claim that in order to maintain an alliance, its partners need to be able to constantly maintain both long and short term orientations. Hamel (1991) claimed that asymmetry between the firms increases the probability of termination of the alliance. Therefore, we would expect long term alliances to have a greater probability of termination, since they need to maintain both long and short term orientations over time.

The following table summarizes the main empirical studies of the literature review. Some studies examine stock market reaction to the alliance by using event study methodology; others examine the success of alliances by various measures: firm size,

longevity etc. However, none of these studies examines the cumulative abnormal return beyond six days after the announcement.

Paper[2]	Author/s	Period covered	No. of firms in sample	Sample boundaries	Event study	Event window range[3]	Capital investment involved	Firm/alliance characteristics examined
1	BarNir A., Smith K.A.	Prior to 2002[4]	149	Small & mid-size manufacturing firms in the North East US	-	-	Not examined	Industry type
6	Chan S.H., Kensinger J.W., Keown A.J., Martin J.D.	1983-1992	345	At least one partner's common stock was publicly traded	+	[-20, +5]	Non capital alliances	Industry type, cooperative agreements, technology
10	Das S, Sen K.P., Sengupta S.	1987-1991	119	Two-party alliances	+	[-5,+5]	Not examined	Technology, firm's profitability, size
15	Dussauge P., Garrette B.	1950-1990	63	International[5] aerospace and defense industry firms	-	-	Not examined	Cooperative agreements, technical quality
19	Hagedoorn J., Schakenraad J.	1980-1988	346	European, American, and Japanese firms	-	-	Not examined	Industry type, country of origin, size
20	Hamel G.	Prior to 2001[6]	9	International alliances	-	-	Not examined	Symmetry of characteristics of partner firms
24	Hoffmann W.H., Schlosser R.	Prior to 2001[7]	164	Small & mid size Austrian firms	-	-	Not examined	Trust, strategic compatibility, governance mechanisms
26	Johnson S.A, Houston M.B.	1991-1995	226	All partner's common stock was publicly traded	+	[-1,0]	Not examined	Horizontal/vertical alliances
32	Koh J., Venkataraman N.	1972-1986	239	Information technology	+	[-2,+1]	Not examined	Cooperative agreements, size, resource similarity

[2] Serial number of the paper as presented in the bibliography section.
[3] Range of days relative to announcement date, for which abnormal market return was examined (relevant only for papers conducting event study).
[4] Empirical data was collected in order to examine if the tendency to ally is determined by company characteristics. Stock market reaction was not examined.
[5] Partner firms originating from different countries
[6] Empirical data was collected in order to examine the stability and longevity of alliances. Stock market reaction was not examined.
[7] Empirical data was collected in order to examine the weights of various success factors in alliance-making in small and mid-size enterprises. Stock market reaction was not examined.

Paper[8]	Author/s	Period covered	No. of firms in sample	Sample boundaries	Event study	Event window range[9]	Capital investment involved	Firm/alliance characteristics examined
33	Liu Q.	1983-1993	118	U.S. Biotech firms	+	[-1,1]	Not examined	
34	McConnell J.J., and Nantell T.J.	1972-1979	210	U.S. domestic joint ventures	+	[-1,0]	Not examined	Technology
35	Neill J., Pfeiffer G.M., Young-Ybarra C.E.	1987-1994	89	Information technology research and development (ITR&D)	+	[-5,+6]	Not examined	25
36	Parkhe A.	1983-1988	342	Limited industries[10], two-party alliances, at least one US firm	-	-	Not examined	Size, alliance type
39	Socher	1997-2002	1,037	German firms	+	[-2,0]	Not examined	Country of origin, structure
41	Woolridge JR., Snow CC.	1972-1987	248	-	+	[-1,10]	Capital investment[11]	Size, technology, horizontal/vertical

[8] Serial number of the paper as presented in bibliography section.
[9] Range of days relative to announcement date, for which abnormal market return was examined (relevant only for papers conducting event study).
[10] Chemicals and allied products, machinery (except electric), electrical and electronic equipment and transport equipment.
[11] Woolridge and Snow (1990) defined capital investment as one of the categories included in the definition of "alliance type"

3. Data & Methodology

3.1 Data

In this study, several hypothesizes are under investigation. Some deal with stock market reaction to strategic alliances, others explore the characteristics of the selected strategic alliances that create value during the event window. Hence, unique data sufficient to test both types of hypothesis was collected. Data collection was conducted in two phases.

In Phase I, an original database consisting of relevant category variables was constructed. The database describes 373 strategic alliances conducted by 493 firms, collected systematically following selection criteria. To obtain our sample of firms entering strategic alliance, we searched the Lexis/Nexis database (including *Business Wire, PR Newswire, Southwest Newswire, Reuters,* and *United Press International).* To perform the search, we retrieved announcements containing the key words 'strategic alliance' in the title of the announcement. The announcements collected were those identified by the search and published between Jan. 1st 1990 and Dec. 31st 1997. Our search identified 373 alliances made by 493 firms in which at least one partner's common stock was publicly traded in any stock exchange in the world.

It is possible to draw several variables from the announcements due to their standardized structure. The variables drawn are characteristics either of the alliance itself (alliance date, alliance goal, etc.) or of the firms initiating the alliance (industry, high/low technology, etc.). The variables are used for conducting the tests presented later in this paper.

In Phase II, numeric data regarding the stock market performance of the firms is added to the database. The data source for stock market performance is the Center for Research on Security Prices daily returns (CRSP) files. Firms having insufficient[12] record history on the CRSP files were omitted from the database. The remaining and final database consists of 289 alliances held by 294 firms. 66 firms appear more than once in our database, hence the total number of firms participating in alliances is 355 (including duplicates).

The main category data collected in Phase I is presented in Tables 1-8. Table 1 shows the annual distribution of the strategic alliances within the sample and the firms participating

in them. Of the 289 sample alliances, 33% were created in 1997 and 25% in 1996. In these alliances, 355 involved firms which had return data available in the CRSP database. Since some firms have more than a single appearance in the database, the total sample consists of 298 firms only. The study considers duplicates as separate observations.

To distinguish alliances from other types of mutual agreements, it is customary to focus on alliances with no capital investment. Table 2 shows the distribution of firms' observations by alliance year and by involvement of capital investment. Capital investment is identified if the alliance announcement indicates cash investment, purchase of shares or exchange of shares. Only 293 observations are of alliances without capital investment, of which 103 are from 1997.

Since the statistical analysis is carried out on observations of alliances with no capital investment, the rest of the descriptive tables (Tables 3-8) presnt the characteristic distribution of observations for both alliance groups (with and without capital investment). Table 3 reveals that the most frequent type of alliance is of mutual manufacture (162 firms of 293 firms). Development alliances consist of 40 firms and marketing alliances of 46 firms[13]

Table 4 indicates that the majority of observations in alliances without capital investment is of low-tech firms (213 out of 293 firms). The proportion of high-tech firms is higher in alliances with capital investment (24 out of 62 firms – 38.7%) than in the other alliances (80 out of 293 firms – 27.3%). The large number of high-tech firms enables a separate analysis of this group in order to compare the results to those of previous studies with a higher proportion of high-tech firms (e.g. Chan et al. ,1997)

Table 5 reveals that most of the firms participating in non capital alliances originate in the US (235 out of 293). 33 of the remaining firms are involved in multinational alliances and the rest (25 firms) may not be classified according to this principle. Table 6 indicates that both groups of marketing alliances, 'Market entry' and 'Existing market', are large enough to be the subject of separate analysis (98 firms and 169 firms respectively).

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[12] Our event study includes data from the 170 days prior to announcement date and the 20 days afterwards. We excluded from our database firms that did no have stock market data for this period.

[13] Development alliances include 'Development', 'Development + manufacture', 'Development + marketing' and 'Mutual development'. Marketing alliances include 'Marketing', 'Development + marketing' and 'Sales & marketing'

'Market entry' alliances are those aiming to enter a new market and 'Existing market' alliances are those aiming to enhance production or sale within partners' markets.

The classification of the firms in alliances without capital investment according to the longevity of the alliance (Table 7) reveals that most (213 out of 293 firms) chose to enter short-term alliances. However, almost half the firms in alliances with capital investment chose to enter into a long-term alliance. Short term alliance is indicated for announcements clarifying that the alliance is for a single product or project. Long term alliance is indicated for more than a single product or project or for firms signing long term agreements.

Table 8 shows that majority of the sample firms are involved in alliances over a new product versus an existing product. This is true for alliances without capital investment (182 out of 293 firms deal with new products) while in alliances with capital investment the majority of the firms (34 out of 62) enter an alliance over an existing product.

These tables suggest that the alliances with capital investment have features signaling a higher prospect of success – high-tech firms in long-term alliances aiming to penetrate their current products into new markets.

3.2 Methodology

We conducted an event study to measure the stock markets' abnormal returns around the announcement of strategic alliances. The methods are similar to those described in Campbell, Lo and Mackinlay (1997). Defining the announcement day as day zero, the market model is estimated for each firm using daily stock returns and S&P 500 returns during the estimation period of days [-170, -21]. The alphas and betas are used in order to measure the abnormal returns in several time windows: [-20,-5], [-4, -2], [-1, 1], [2, 4], [5, 20], [-1, 20]. The window [-1, 1] is defined to be the event window or announcement window. Standard deviation of the abnormal returns is used to apply cross-sectional t tests for the mean of the abnormal returns during each time window. Additional non-parametric tests of Wilcoxon sign test (binomial test) and Wilcoxon sign rank tests are also used to test whether the median of the abnormal returns is zero.

4. Results

In this section we report the results for the stock market response to announcements on strategic alliances. Overall, we find that stock markets react positively to market announcements during the announcement window but that stock prices fall to the level prior to the announcement within 20 days of the announcement. Table 9 presents the results of the event study for the entire sample. Panel A reports that the abnormal return (AR) for the entire sample during the announcement window (days [-1, 1]) is positive and statistically significant. 56.34% of the stocks in the sample respond positively to the announcement. While the average abnormal return during the event window is 1.69%, the median is only 0.45%. However sign-test and rank-sum-test counter the null hypothesis that the median of the abnormal return is zero. To test whether strategic alliances have a positive response even in the case that they do not involve any capital investment, the statistical tests are re-conducted on two sub-samples. Panel B shows the results for 293 firms participating in strategic alliances that do not involve any capital investment and Panel C the results for the other 62 firms. The response during the announcement window is positive and statistically significant for both sub-samples. However, the average and median abnormal returns are higher for the cases of capital investment (3.00% and 1.14% respectively, compared to 1.41% and 0.37%). The difference in response is also reflected in the proportion of the firms that respond positively to the announcement, 62.90% vs. 54.95% only.

These results are in line with those of Chan et al. (1997), Das et al. (1998), Koh and Venkataraman (1991), Woolridge and Snow (1990), Johnson and Houston (2000), Neil et al. (2001) who report positive AR around the announcement day, leading to the conclusion that strategic alliances create value even when there are no capital investments involved. However, calculating the AR for the [5, 20] window refute this conclusion. Focusing on the alliances that do not involve capital investment (as in previous studies), the abnormal returns in this window are shown to be significantly negative (mean of -1.85% and median of -1.13%). The cumulative abnormal return for the window [-1, 20] is also negative but statistically insignificant (mean of -0.55% and median of -1.13%). 48.12% only of the firm have positive abnormal returns during the [-1, 20] window.

The sub-sample of the alliances that involve capital investments (Panel C) show mixed results. The average abnormal return during the [5, 20] window is negative (-0.84%) but the median is positive (0.84%). The cumulative abnormal return during the [-1, 20] window is positive in average (2.51%) but has a negative median (-0.47%). None of the figures (means and medians) for the periods [5, 20] and [-1, 20] is statistically significant.

These results suggest that immediately after the announcement, the market attaches positive value to the strategic alliance, even in the case that it does not involve any capital investment. However, in a short period of 20 days after the announcement, the market reverses its response. This is a typical overreaction as documented by De Bondt and Thaler (1985) and Mitchel et al. (2004). Analyzing the cumulative abnormal returns within 20 days from the announcement, one cannot conclude that strategic alliances create value to their participants.

From now on, the analysis deals with strategic alliances that leave out any capital investment. The next stage would be to exclude the possibility that the results reflect a negative momentum in the returns of the participants' stocks. Table 9 shows that the abnormal returns during the time-windows [-20, -5] and [-4, -2] are negative as well. It can be argued that strategic alliances arise during periods of negative momentum. The question of negative momentum as a trigger for alliances is not within the scope of this paper. However, it is necessary to exclude the possibility that negative abnormal returns during the [5, 20] window reflect the continuation of this negative momentum.

It should be noted that while the negative abnormal returns during the [5, 20] window are statistically significant, the abnormal returns during the [-20, -5] window are not. Nevertheless, a special analysis is carried out to address the question of momentum. Table 10 shows the results of an event study carried out on four sub-samples. The 293 firms are sorted according to their abnormal returns during the [-20, -5] window. Quarter 1 consists of the firms with the lowest abnormal returns during [-20, 5] and Quarter 4 with the highest. Panels A to D show the results for Quarters 1 to 4 respectively. Momentum seems indeed to explain some of the results. It is evident that the AR during the [5, 20] window corresponds to the AR during [-20, -5]. The higher the AR during [-20, -5], the higher is the AR during [5, 20].

However, results for Quarter 3 are of special interest. While the mean and the median of the AR for this group during [-20, -5] are positive, the mean and the median of the AR during [5, 20] are negative. And while 87.67% of the firms had positive AR during [-20, -5], 56.16% had negative AR during [5, 20]. Despite the statistically significant positive AR during the event window [-1, 1], the cumulative AR during the [-1, 20] has negative mean and median and is statistically insignificant. Furthermore, the only quarter with positive AR during [5, 20] is Quarter 4, with AR during [-20, -5] that averages to 18.77% compared to 1.53% only during [5, 20]. We conclude that the reversal in market returns following the announcements is beyond a possible momentum effect.

The reversal in market returns can be interpreted as a response to over-reaction during the event window. It is reasonable that in the few weeks following the announcement the market re-examines the value created by the strategic alliance. If the market attributed zero value to all strategic alliances, there would be no sense in the positive immediate response of the market to the announcement. Therefore we should expect positive value in strategic alliances at least in some firms. To test this hypothesis, the sample is sorted according to the AR during the event window [-1, 1]. Then the sample is grouped into four quarters, where Quarter 1 consists of the firms with the lowest AR during the event window [-1,1] and Quarter 4 those with the highest. The results for the event study are presented in Table 11. Quarters 3 and 4 are of special interest. These firms had positive AR during the event window. They also experienced reversal in returns during the [5, 20] window, but the cumulative AR during [-1, 20] remains positive and in the case of Quarter 4 even statistically significant. It can be concluded that the response of the market to strategic alliances is selective. Strategic alliances with strong stock market response during the announcement window are perceived as value creators even 20 days after the announcement.

The next stage in the analysis aims to explore the characteristics of the selected strategic alliances that do create value during [-1, 20]. Table 12 shows the results of the re-examination of higher value creation in the high-tech industry as documented by Das et al. (1998). The sample is divided into two sub-samples. Panel A contains the results for the high-tech companies and Panel B the results for the rest. The two groups respond following the same pattern as the entire sample. However, while the results for the low-

tech companies are statistically insignificant, the results for the high-tech companies are stronger (in absolute terms) and statistically significant both during the event window [-1, 1] and the reversal window [5, 20]. The AR during [-1, 20] is negative and statistically insignificant for the high-tech companies, as for the entire sample. Value creation appears to be absent among high-tech firms.

The re-examination of the size effect is shown in Table 13. For this purpose, the sample is divided into two sub-samples based on the value of the total assets (retrieved from COMPUSTAT). Panel A shows the results for firms that are larger than the median in the sample (128.98$ million) and Panel B for the smaller firms. It is evident that the smaller firms' response is stronger in absolute terms both during the announcement window (as in Chung et al., 2006) and the response window. However, once again the cumulative AR during [-1, 20] is negative and statistically insignificant. The larger firms' response during [-1, 20] is positive but again statistically insignificant.

To address the relevance of the geographic location of the alliance parties (as documented by Parkhe, 1993), the sample is grouped again according to the location of all parties in the alliance (Table 14). Alliances all of whose parties are incorporated in the US are called 'National' and those with at least one company located outside the US are called 'Multinational'. The results concerning this issue are mixed. While the AR of multinational alliances during the event window is higher, it is statistically insignificant. The national alliances behave as the entire sample. A larger sample of multinational alliances would probably produce clearer results.

Alliances dealing with a current product are expected to have a higher probability of succeeding compared to alliances dealing with new products. Table 15 compares the results of the event study for the two sub-samples, one for firms tied in alliances for current markets and the other for firms in alliances aiming at a new market. It appears that alliances dealing with current markets indeed have a higher and statistically significant market response. The reversal in returns of new-market alliances appears to be strong and statistically insignificant. Yet the cumulative AR of the 'current market' alliances does not appear to be statistically significant within 20 days after the announcement.

The issue of the stability of the alliances is tested and reported in Table 16. As expected, short-tem alliances have a positive statistically significant response during the announcement window [-1,1] especially compared to the long-term alliances. Once again, the statistically significant market reversal during [5, 20] eliminates this AR and short-term alliances do not appear to be more valuable.

To conclude, none of the characteristics documented in the literature predicting higher-value creation by strategic alliances appears to be economically and statistically significant when observing abnormal returns within 20 days after announcement days.

5. Summary and Conclusions

The current empirical literature testing value creation through strategic alliances, uses short-run event study methodology, and concludes with significant value creation by strategic alliances. Using a sample of 335 firms participating in 289 alliances over the years 1990-1997, we show that the positive value related to strategic alliances is due to over-reaction. We show that 20 days after announcing the alliance positive cumulative abnormal returns are only present in alliances that draw the highest market response at the announcement time interval. We also show that stocks of firms with several characteristics (such as high-tech, small size and participants in alliances focusing on current markets) exhibit a higher positive response to new alliances. However none of the tested characteristics is able to predict a positive abnormal return beyond the 20 days.

We conclude that the positive value of strategic alliances evident in previous research may simply be a product of mis-measurement of abnormal returns in the presence of short-run stock market anomalies. The only signal predicting persistent market response beyond the 20 days is the market's response itself at the time of announcement. Hence, we conclude that the stock market does identify the more valuable alliances. However, only long-run analysis of real achievements of strategic alliances, rather than observation of stock market response, may produce conclusive results in the evaluation of strategic alliances.

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Tables

Table 1

Annual distribution of strategic alliance announcements

This table shows the annual distribution of strategic alliance announcements and the number of firms involved in them throughout the period 1990-1997. Announcements were identified searching the Lexis/Nexis database using the key words "strategic alliance". Announcements in which neither firm has return data on CRSP available were omitted.

No. of firms[14]	Percent of total	No. of announcements	Year of announcement
5	2%	5	1990
16	4%	12	1991
27	8%	23	1992
36	10%	29	1993
47	13%	38	1994
16	4%	13	1995
92	25%	73	1996
116	33%	96	1997
355	100%	289	Total

Table 2

Firms' distribution by capital investment and by year

This table shows the annual distribution of firms in the sample by whether, according to the announcement, a type of capital investment (purchase of shares or direct investment) was involved in the announced alliance.

Capital investment									
	1990	1991	1992	1993	1994	1995	1996	1997	Total
No	4	13	23	27	35	14	74	103	293
Yes	1	3	4	9	12	2	18	13	62
Total	5	16	27	36	47	16	92	116	355

[14] Including duplicates (there are records of 355 firms, consisting of 289 firms, some of which appear more than once in the database)

Table 3

Firms' distribution by capital investment and by alliance type

This table shows the distribution of firms in the sample by alliance type and whether the alliance involved any type of capital investment (purchase of share or direct investment), as inferred from the announcement.

Total	No	Yes	Alliance product /Capital investment
31	24	7	Unknown[15]
2		2	Consulting
32	27	5	Development
17	7	10	Development + manufacture
5	5		Development + marketing
15	14	1	Distribution
13	4	9	Equity investment
5	4	1	Knowledge
3	3		Maintenance
30	23	7	Marketing
1	1		Mutual developments
177	162	15	Mutual manufacture
1	1		Operational
23	18	5	Sales & marketing
355	293	62	Total

Table 4

Firms' distribution by capital investment and by technology (high/low)

This table shows the distribution of firms in the sample by level of technology and whether the alliance involved any type of capital investment. SIC is used for industrial classification and high-tech versus low-tech classifications are based on Business Week's classification scheme.

Capital investment/Firm's technology	High-tech	Low-tech	Total
No	80	213	293
Yes	24	38	62
Total	104	251	355

[15] Not mentioned in the announcement or may not be derived from it.

Table 5

Firms' distribution by capital investment and by alliance deployment (national/multinational)

This table shows the distribution of multinational / national firms in the sample according to whether the alliance involved any type of capital investment. A multinational alliance is one in which one partner is located in the US and the other is not.

Capital investment/deployment	National	Multinational	Unknown[16]	Total
No	235	33	25	293
Yes	37	18	7	62
Total	272	51	32	355

Table 6

Firms' distribution by capital investment and by marketing goal (existing market/ market entry)

This table shows the distribution of firms in the sample by the marketing goal of the alliance according to whether the alliance involved any type of capital investment. Marketing goals are either (1) entering a new market or (2) enhancing sales in an existing market.

Capital investment/marketing goal	Market entry	Existing market	Unknown[17]	Total
No	98	169	26	293
Yes	26	29	7	62
Total	124	198	33	355

[16] Not mentioned in the announcement and/or cannot be inferred from it.
[17] Not mentioned in the announcement and/or cannot be inferred from it.

Table 7

Firms' distribution by capital investment and by longevity of the alliance (short term/ long term)

This table shows the distribution of firms in the sample by the longevity goal of the alliance according to whether the alliance involved any type of capital investment. A short term alliance is indicated for announcements which make clear that the alliance is merely for a single product or project. A long term alliance is indicated for more than a single product or project, or for firms signing long term agreements.

Capital investment/longevity	Long term	Short term	Unknown[18]	Total
No	54	213	26	293
Yes	26	29	7	62
Total	80	242	33	355

Table 8

Firms' distribution by capital investment and by alliance product (existing/ new)

This table shows the distribution of firms in the sample by e innovation in the alliance product according to whether the alliance involved any type of capital investment. The alliance product is either (1) existing or (2) new.

Capital investment/alliance product	New	Existing	Unknown[19]	Total
No	182	85	26	293
Yes	21	34	7	62
Total	203	119	33	355

[18] Not mentioned in the announcement and/or cannot be inferred from it.
[19] Not mentioned in the announcement and/or cannot be inferred from it.

Table 9

Stock market reaction around announcement on strategic alliances

The following table shows the abnormal return (AR) of the stock prices around announcement on strategic alliances. Panel A shows the results for the entire sample. Panel B shows the results for firms in alliances that do not involve any type of capital investment (shares or cash exchange). Panel C shows the results for firms in alliances that do include capital investment. The null hypothesis under the t-test is that the mean of AR=0, and under the sign test and sign-rank test - median of AR=0.

		[-20, -5]	[-4, -2]	[-1, 1]	[2,4]	[5,20]	[-1, 20]
Panel A –	AR (%) - mean	-0.67	-0.34	1.69	-0.09	-1.61	-0.02
All firms	AR (%) - median	-0.92	-0.59	0.45	-0.01	-1.30	-0.94
	t test p val	0.22	0.19	0.00	0.41	0.03	0.49
	% of ARs>0	46.20	44.51	56.34	49.86	44.51	48.17
	Sign test p val	0.07	0.02	0.01	0.46	0.02	0.23
	Sign rank p val	0.26	0.06	0.00	0.78	0.05	0.98
	N	355	355	355	355	355	355
Panel B -							
No capital	AR (%) - mean	-0.67	-0.26	1.41	-0.11	-1.85	-0.55
investment	AR (%) - median	-0.79	-0.69	0.37	-0.04	-1.59	-1.13
	t test p val	0.25	0.27	0.00	0.40	0.03	0.32
	% of ARs>0	46.76	44.37	54.95	49.15	42.66	48.12
	Sign test p val	0.15	0.02	0.04	0.41	0.01	0.28
	Sign rank p val	0.37	0.14	0.02	0.66	0.04	0.79
	N	293	293	293	293	293	293
Panel C -	AR (%) - mean	-0.66	-0.73	3.00	-0.01	-0.48	2.51
Capital	AR (%) - median	-1.10	-0.24	1.14	0.33	0.84	-0.47
investment	t test p val	0.36	0.19	0.00	0.49	0.40	0.13
	% of ARs>0	43.55	45.16	62.90	53.23	53.23	48.39
	Sign test p val	0.19	0.19	0.02	0.26	0.26	0.45
	Sign rank p val	0.40	0.19	0.01	0.79	0.89	0.52
	N	62	62	62	62	62	62

Table 10

Stock market reaction to announcement on strategic alliances and momentum

The following table shows the abnormal return of the stock prices around announcement on strategic alliances when there is no exchange of shares, nor any capital investment. The sample is by the abnormal return during the period 20 to 5 days before the announcement. Panel A shows the results for the group with the lowest abnormal return during days [-20, -5], Panel D, the group with the highest.

		[-20, -5]	[-4, -2]	[-1, 1]	[2, 4]	[5, 20]	[-1, 20]
Panel A -	AR (%) - mean	-20.26	0.33	1.29	-1.08	-4.09	-3.88
Quarter 1	AR (%) - median	-17.49	0.08	-0.30	-2.49	-3.46	-1.94
(lowest)	t test p val	0.00	0.38	0.11	0.15	0.05	0.09
AR [-20,-5]	% of ARs>0	0.00	52.05	47.95	41.10	36.99	47.95
	Sign test p val	0.00	0.41	0.41	0.05	0.01	0.41
	Sign rank p val	0.00	0.49	0.68	0.03	0.05	0.22
	N	73	73	73	73	73	73
Panel B -							
Quarter 2	AR (%) - mean	-4.04	-0.53	1.76	0.44	-2.81	-0.61
AR [-20,-5]	AR (%) - median	-3.82	-1.09	0.36	0.47	-2.29	-1.87
	t test p val	0.01	0.24	0.01	0.28	0.05	0.38
	% of ARs>0	0.00	43.24	55.41	54.05	37.84	43.24
	Sign test p val	0.00	0.10	0.15	0.28	0.02	0.10
	Sign rank p val	0.00	0.07	0.25	0.34	0.10	0.51
	N	74	74	74	74	74	74
Panel C -							
Quarter 3	AR (%) - mean	2.88	0.40	1.36	-0.56	-2.02	-1.23
AR [-20,-5]	AR (%) - median	2.46	0.23	1.14	-0.01	-2.03	-0.85
	t test p val	0.05	0.31	0.04	0.24	0.13	0.28
	% of ARs>0	87.67	53.42	60.27	49.32	43.84	47.95
	Sign test p val	0.00	0.24	0.05	0.50	0.17	0.41
	Sign rank p val	0.00	0.71	0.04	0.67	0.17	0.85
	N	73	73	73	73	73	73
Panel D -							
Quarter 3	AR (%) - mean	18.77	-1.24	1.22	0.76	1.53	3.51
(highest)	AR (%) - median	14.68	-1.79	0.71	0.36	1.05	2.59
AR [-20,-5]	t test p val	0.00	0.07	0.07	0.18	0.21	0.06
	% of ARs>0	100.00	28.77	56.16	52.05	52.05	53.42
	Sign test p val	0.00	0.00	0.17	0.41	0.41	0.24
	Sign rank p val	0.00	0.01	0.18	0.39	0.32	0.12
	N	73	73	73	73	73	73

Table 11

Stock market reaction to announcement on strategic alliances sorted by the level of the response

The following table shows the abnormal return of the stock prices around announcement on strategic alliances when there is no exchange of shares nor any capital investment. The sample is sorted according to the abnormal return during the period [-1, 1]. Panel A shows the results for the group with the lowest abnormal return during days [-1, 1], Panel D, the group with the highest.

		[-20, -5]	[-4, -2]	[-1, 1]	[2, 4]	[5, 20]	[-1, 20]
Panel A -	AR (%) - mean	-2.39	1.70	-6.28	-0.67	-2.74	-9.69
Quarter 1	AR (%) - median	-1.83	0.08	-4.34	-0.36	-2.92	-10.05
(lowest)	t test p val	0.13	0.03	0.00	0.23	0.10	0.00
AR [-1, 1]	% of ARs>0	45.21	50.68	0.00	47.95	38.36	32.88
	Sign test p val	0.24	0.41	0.00	0.41	0.03	0.00
	Sign rank p val	0.00	0.09	0.19	0.36	0.84	0.41
	N	73	73	73	73	73	73
Panel B -	AR (%) - mean	-1.33	-0.71	-1.01	-0.56	-1.55	-3.13
Quarter 2	AR (%) - median	-0.79	-0.89	-1.01	-0.19	-1.15	-2.31
AR [-1, 1]	t test p val	0.24	0.19	0.10	0.24	0.20	0.07
	% of ARs>0	43.84	38.36	19.18	47.95	42.47	39.73
	Sign test p val	0.17	0.03	0.00	0.41	0.12	0.05
	Sign rank p val	0.00	0.09	0.19	0.36	0.84	0.41
	N	73	73	73	73	73	73
Panel C -	AR (%) - mean	1.08	0.07	2.14	0.63	-1.40	1.37
	AR (%) - median	0.59	-0.29	2.28	0.59	-0.72	0.74
AR [-1, 1]	t test p val	0.26	0.46	0.00	0.19	0.20	0.24
	% of ARs>0	52.70	47.30	100.00	52.70	45.95	50.00
	Sign test p val	0.28	0.36	0.00	0.28	0.28	0.45
	Sign rank p val	0.00	0.09	0.19	0.36	0.84	0.41
	N	74	74	74	74	74	74
Panel D -	AR (%) - mean	-0.08	-2.11	10.78	0.16	-1.72	9.21
Quarter 3	AR (%) - median	-0.50	-1.80	8.86	-0.24	-1.35	8.27
(highest)	t test p val	0.49	0.02	0.00	0.44	0.23	0.00
AR [-1, 1]	% of ARs>0	45.21	41.10	100.00	47.95	43.84	69.86
	Sign test p val	0.24	0.08	0.00	0.41	0.17	0.00
	Sign rank p val	0.00	0.09	0.19	0.36	0.84	0.41
	N	73	73	73	73	73	73

Table 12

Stock market reaction to announcement on strategic alliances – high-tech vs. low-tech

The following table shows the abnormal return of the stock prices around announcement on strategic alliances when there is no exchange of shares, nor any capital investment. The 2-digit SIC for each firm is used to classify it as a high-tech firm or not. Panel A shows the results for the high-tech firms and Panel B for the other firms (low-tech).

		[-20, -5]	[-4, -2]	[-1, 1]	[2, 4]	[5, 20]	[-1, 20]
Panel a -	AR (%) - mean	-0.74	-0.22	1.63	-0.26	-2.02	-0.66
High-tech	AR (%) - median	-1.47	-0.63	0.45	-0.28	-1.25	-0.94
	t test p val	0.27	0.34	0.00	0.31	0.05	0.32
	% of ARs>0	46.01	45.07	53.99	48.83	42.72	47.89
	Sign test p val	0.14	0.09	0.11	0.39	0.02	0.29
	Sign rank p val	0.00	0.09	0.19	0.36	0.84	0.41
	N	213	213	213	213	213	213
Panel B -	AR (%) - mean	-0.50	-0.36	0.82	0.30	-1.39	-0.27
Other	AR (%) - median	-0.05	-0.90	0.33	0.01	-2.73	-1.50
(low-tech)	t test p val	0.38	0.31	0.13	0.34	0.20	0.45
	% of ARs>0	48.75	42.50	57.50	50.00	42.50	48.75
	Sign test p val	0.46	0.11	0.07	0.46	0.11	0.46
	Sign rank p val	0.00	0.09	0.19	0.36	0.84	0.41
	N	80	80	80	80	80	80

Table 13

Stock market reaction to announcement on strategic alliances – big vs. small firms

The following table shows the abnormal return of the stock prices around announcement on strategic alliances when there is no exchange of shares, nor any capital investment. Panel A shows the results for the group with total assets greater than 128.98$ million (big firms) and Panel B for the rest (small firms).

		[-20, -5]	[-4, -2]	[-1, 1]	[2, 4]	[5, 20]	[-1, 20]
Panel A -	AR (%) – mean	-0.69	-0.62	0.68	0.17	0.44	1.29
Big firms	AR (%) – median	-1.47	-0.73	0.33	0.15	-0.44	1.38
	t test p val	0.25	0.08	0.06	0.35	0.33	0.14
	% of ARs>0	43.15	41.10	56.16	52.74	47.95	51.37
	Sign test p val	0.06	0.02	0.06	0.23	0.34	0.34
	Sign rank p val	0.00	0.09	0.19	0.36	0.84	0.41
	N	146	146	146	146	146	146
Panel B -	AR (%) - mean	-0.66	0.09	2.13	-0.39	-4.13	-2.38
Small firms	AR (%) - median	0.10	-0.40	0.50	-0.55	-3.50	-1.55
	t test p val	0.35	0.45	0.00	0.30	0.01	0.12
	% of ARs>0	50.34	47.62	53.74	45.58	37.41	44.90
	Sign test p val	0.43	0.31	0.16	0.16	0.00	0.12
	Sign rank p val	0.00	0.09	0.19	0.36	0.84	0.41
	N	147	147	147	147	147	147

Table 14

Stock market reaction to announcement on strategic alliances – national vs. multinational alliances

The following table shows the abnormal return of the stock prices around announcement on strategic alliances when there is no exchange of shares, nor any capital investment. Panel A shows the results for the group of firms in alliances where both firms are from the same country (national) and Panel B for the rest (multinational alliances).

		[-20, -5]	[-4, -2]	[-1, 1]	[2, 4]	[5, 20]	[-1, 20]
Panel A -	AR (%) - mean	-0.26	-0.09	1.40	0.19	-1.95	-0.36
National	AR (%) - median	-0.32	-0.60	0.37	0.21	-1.39	-0.60
	t test p val	0.41	0.43	0.00	0.34	0.04	0.39
	% of ARs>0	48.09	43.83	55.32	53.19	43.40	48.94
	Sign test p val	0.30	0.03	0.04	0.15	0.03	0.40
	Sign rank p val	0.00	0.09	0.19	0.36	0.84	0.41
	N	235	235	235	235	235	235
Panel B -	AR (%) - mean	-0.57	-0.05	2.16	-1.86	-0.77	-0.47
Multinational	AR (%) - median	-2.59	-1.60	0.93	-1.17	-1.80	-1.21
	t test p val	0.44	0.49	0.08	0.11	0.41	0.46
	% of ARs>0	42.42	48.48	54.55	30.30	39.39	48.48
	Sign test p val	0.24	0.50	0.24	0.02	0.15	0.50
	Sign rank p val	0.00	0.09	0.19	0.36	0.84	0.41
	N	33	33	33	33	33	33

Table 15

Stock market reaction to announcement on strategic alliances – current market vs. market entry

The following table shows the abnormal return of the stock prices around announcement on strategic alliances when there is no exchange of shares, nor any capital investment. Panel A is for the group of firms in alliances that deal with a current product of one of the companies (current market), and Panel B with firms in alliances dealing with entry to a new market by both companies (market entry).

		[-20, -5]	[-4, -2]	[-1, 1]	[2, 4]	[5, 20]	[-1, 20]
Panel A -	AR (%) - mean	-0.11	-0.77	1.76	0.31	-1.28	0.79
Current	AR (%) - median	-0.01	-1.41	0.61	0.18	-0.86	2.16
Market	t test p val	0.47	0.09	0.00	0.29	0.16	0.30
	% of ARs>0	49.70	36.69	56.80	52.66	44.97	53.25
	Sign test p val	0.50	0.00	0.03	0.22	0.11	0.18
	Sign rank p val	0.00	0.09	0.19	0.36	0.84	0.41
	N	169	169	169	169	169	169
Panel B -	AR (%) - mean	-0.60	1.12	1.03	-0.70	-2.68	-2.34
Market	AR (%) - median	-3.02	0.55	0.14	-0.46	-2.87	-2.24
Entry	t test p val	0.37	0.07	0.09	0.18	0.06	0.13
	% of ARs>0	43.88	58.16	52.04	46.94	39.80	41.84
	Sign test p val	0.13	0.04	0.31	0.31	0.03	0.06
	Sign rank p val	0.00	0.09	0.19	0.36	0.84	0.41
	N	98	98	98	98	98	98

Table 16

Stock market reaction to announcement on strategic alliances – short-term vs. long-term alliance

The following table shows the abnormal return of the stock prices around announcement on strategic alliances when there is no exchange of shares, nor any capital investment. Panel A is for firms in short-term alliances and Panel B for the rest (long-term)

		[-20, -5]	[-4, -2]	[-1, 1]	[2, 4]	[5, 20]	[-1, 20]
Panel A -	AR (%) - mean	0.55	-0.08	1.54	-0.03	-2.52	-1.02
Short-term	AR (%) - median	-0.34	-0.74	0.61	0.07	-2.21	-0.85
alliance	t test p val	0.33	0.44	0.00	0.48	0.02	0.24
	% of ARs>0	47.89	43.19	56.81	51.17	41.31	48.36
	Sign test p val	0.29	0.03	0.02	0.34	0.01	0.34
	Sign rank p val	0.00	0.09	0.19	0.36	0.84	0.41
	N	213	213	213	213	213	213
Panel B -	AR (%) - mean	-3.58	-0.06	1.33	-0.17	1.08	2.24
Long-term	AR (%) - median	-1.69	-0.13	-0.21	-0.39	0.65	2.27
alliance	t test p val	0.04	0.47	0.07	0.42	0.30	0.17
	% of ARs>0	46.30	50.00	48.15	48.15	50.00	51.85
	Sign test p val	0.34	0.45	0.45	0.45	0.45	0.34
	Sign rank p val	0.00	0.09	0.19	0.36	0.84	0.41
	N	54	54	54	54	54	54