

THE IMPACT OF DIFFERENT TYPES OF INTERORGANIZATIONAL COOPERATION ON SHAREHOLDER VALUE – THE CASE OF GERMANY

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Abstract

This event study analyses stock market reactions of 621 ad-hoc notifications announcing interorganizational cooperative agreements issued by stock listed German firms between 1999 and 2007. Besides testing the general relationship between ad hoc notifications of interorganizational cooperations and stock market response this study is the first one analyzing different institutional types of cooperational agreements for the German stock market. The announcement cooperational agreements results in significant positive mean abnormal returns. Surprisingly, announcements of contractual partnerships yield the highest abnormal returns compared to alternative forms combined with equity stakes. Obviously, shareholders do not necessarily relate better control of interorganizational cooperation to ownership.

Keywords: interorganizational cooperation, shareholder value, stock market reactions, event study

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Introduction

The last three decades have seen a surge of research suggesting firms can increase performance by entering interorganizational cooperative agreements. The general assumption is that there is economic rationale behind the establishment of a cooperational agreement affecting firm value. Regularly, several theoretical approaches such as transaction cost economics, or the resource-based view amongst others are referred to in order to explain this effect.

Applying standard event study methodology, this study analyzes stock market reactions to 612 ad hoc announcements of interorganizational cooperative agreements issued by German stock listed firms between 1999 and 2007. Although previous studies were able to show a general relationship between cooperational agreements and stock market response (e.g. Chan et al. 1997, Das et al. 1998, Allen & Phillips 2000, Neill et al. 2001, Kale et al. 2002, Häußler 2006), this study will not only analyze the general relationship between the announcement of cooperational agreements and the stock market's reaction, but also differentiate the analysis in terms of alternative institutional types of agreements and therefore go beyond existing results. Main research questions addressed here are: (1) What is the stock market's reaction to ad hoc notifications of interorganizational cooperational agreements? (2) To what extent does it make a difference for corporate shareholders when equity is (not) involved in a cooperational agreement?

The article is organized as follows: section 2 defines and classifies interorganizational cooperational agreements. Section 3 develops the hypotheses tested

in this study and gives a brief literature review. Section 4 and 5 describes the data and the research methodology respectively. The empirical results of the event study are reported in section 6 and discussed in section 7. Section 8 concludes with limitations and further research opportunities.

Interorganizational cooperative agreements

For our purposes, an interorganizational cooperative agreement is any long term, interdependent and explicit agreement amongst two or more firms (e.g. Oliver 1990). This agreement can but does not need to involve equity stakes. To meet the definition, the agreement must be long term; i.e. a one time spot market transaction is not a cooperative agreement. Interdependency means that the inter-firm exchange relation is bilateral and involves either a pooling or exchange of resources (Thompson 1967, Pfeffer & Nowak 1976, Kogut 1989). The agreement must be explicit, which means there must be an ex ante intention to cooperate.

Interorganizational agreements can be subdivided into several types. One major distinction will be made in terms of equity stakes (see Figure 1).

Insert Figure 1 here

Depending on the extent of the equity stake we distinguish minority and majority participation. Joint ventures arise whenever two (or more) firms create a new legal entity, jointly owned and controlled by the parent organizations (Pfeffer & Nowak 1976, McCon-

nell & Nantell 1985, Harrigan 1988, Hennart 1988, Kogut 1988, Gulati & Singh 1998); minority or majority investments in contrast do not create a separate entity. Since the objective of this paper is to study cooperational agreements between market transactions and internal organization which often occurs as merger, mergers are not treated as cooperative agreement. Interorganizational agreements without equity stakes can be divided into relational and contractual agreements. This distinction is following the governance structure literature (Macneil 1978, Lee & Cavusgil 2006). While the former just relies on mutual trust, embeddedness in social relationships and commitment (Dyer & Singh 1998, Gulati 1998, Kale et al. 2000), the latter requires formal contracts or other forms of formalized legally-binding agreements; i.e. promises or obligations to perform particular actions in the future (Macneil 1978, Williamson 1979). Examples of contractual cooperations are exploration consortia, licensing agreements, research partnerships, development or co-production agreements, supplier contracts, marketing agreements, or strategic alliances (Contractor & Lorange 1988, Borys & Jemison 1989, Barringer & Harrison 2000). Solely relational cooperative agreements will be excluded from this study as well as non-explicit (i.e. implicit) cooperational agreements for methodological reasons because they are hard to identify as a subject of research in reality due to their non-apparentness.

Hypotheses and literature review

Considering transaction cost economics (Williamson 1975), which describes a dynamic equilibrium between internalizing and externalizing of economic activities, “firms pursue cooperative agreements in order to gain fast access to new technologies or new markets, to benefit from economies of scale in joint research and/or production, to tap into sources of know-how located outside the boundaries of the firm, and to share the risks for activities that are beyond the scope of the capabilities of a single organization” (Powell 1990, p. 315). Such advantages should create shareholder value that an efficient capital market would have to reflect (Das et al. 1998). Measuring this value effect is a major goal of this study. The resource-based view of the firm argues that enhanced profitability is due to a firm’s critical resources rather than industry structure. This approach views the firm as a bundle of rare, valuable, non-substitutable, and difficult to imitate resources and capabilities (Wernerfelt 1984, Barney 1991, Amit & Schoemaker 1993, Gulati et al. 2000). As early proponents of a resource-based view Alchian & Demsetz (1972, p. 777) argue that “resource owners increase productivity through cooperative specialization and this leads to the demand for economic organizations which facilitate cooperation“. Dyer & Singh (1998, p. 661) have explicitly added interorganizational relations as a discrete class of objects to the resource-based view, whereas „productivity gains in the

value chain are possible when trading partners are willing to make relation-specific investments and combine resources in unique ways. ... Thus, idiosyncratic interfirm linkages may be a source of relational rents and competitive advantage“. This extension is also commonly taken up under the term “relational view” (Dyer & Singh 1998, Lavie 2006). Besides these theoretical approaches also some previous empirical studies were able to show a positive relation between the announcement of a cooperational agreement and the stock market’s reaction (e.g. McConnell & Nantell 1985, Koh & Venkatraman 1991, Chan et al. 1997, Das et al. 1998, Allen & Phillips 2000, Neill et al. 2001, Kale et al. 2002; Häussler 2006). Thus, we set forth the following:

Hypothesis 1: The announcement of interorganizational cooperative agreements will result in a positive stock market reaction.

Interorganizational cooperative agreements were subdivided into several types with respect to their institutional scope and the extent of interorganizational dependence (see Figure 1). Beginning with the less dependent form, literature widely discusses the benefits of contractual partnerships and strategic alliances. According to the theory of optimal application of knowledge within an organization Jensen & Meckling (1995) argue that strategic alliances can be more cost-effective than the integrated firms by creating mechanisms that better align decision authority with decision knowledge. Moreover, alliances provide a platform for organizational learning, giving firms access to the knowledge of their partners. Accordingly, the long-term strategic advantage caused by strategic alliances should result in positive stock market reactions. This argument finds strong support via empirical studies. Anand & Khanna (2000) find significant abnormal returns for firms entering licensing agreements. Das et al. (1998) and Chan et al. (1997) report positive abnormal returns for non-equity cooperations. Hence, we postulate:

Hypothesis 2a: The announcement of contractual partnerships will result in a positive stock market reaction.

The main distinction between equity and non-equity cooperational agreements is made, especially because equity ties can be received as a stronger commitment from the partner than it would be implicit in a strategic alliance. Equity relations are similar to “strong” ties and may signal the market an additional level of commitment (Granovetter 1973, Stuart et al. 1999). Considering transaction cost economics, equity is seen as an indicator of hierarchy because it is regarded to be an effective mechanism for managing profit sharing concerns. The benefits of equity stakes could also be explained by contractual inefficiencies because it is impossible to contractually specify all the terms of a cooperational agreement (Grossman & Hart 1986). Depending on the extent of the equity stake minority and majority participations are distinguished. Therefore, we postulate:

Hypothesis 2b: The announcement of minority participations will result in a positive stock market reaction.

Hypothesis 2c: The announcement of majority participations will result in a positive stock market reaction.

Joint ventures involve the joining together of a subset of the resources of two (or more) firms under the joint management of two (or more) parent firms. Chen et al. (1991) point out three major sources for gaining value via joint venturing: The first source arises from cost savings obtained by joint production. The second is the ability of capturing informational externalities and the third is a stream of valuable options of altering real economic activities. The latter directly refers to real options theory, which treats interorganizational agreements in general as options to invest in new markets or technologies, or to acquire another firm. Joint ventures in particular offer the options of expanding in response to future technological and market developments and of waiting to invest (acquire) as two polar types of real option strategies (Folta & Miller 2002, Scherpereel 2008). There are several empirical studies proving that joint venturing has a positive impact on stock market performance (e.g. McConnell & Nantell 1985, Woolridge & Snow 1990, Koh & Venkatraman 1991, Chen et al. 1991, Madhavan & Prescott 1995, Park & Kim 1997, Reuer & Miller 1997, Allen & Phillips 2000, Johnson & Houston 2000). Hence, we postulate:

Hypothesis 2d: The announcement of joint ventures will result in a positive stock market reaction.

Sample

This event study is based on ad hoc notifications of interorganizational cooperative agreements of German stock market listed firms which have been obliged to announce ad hoc notifications since 1995. According to §§ 13 and 15 German Securities Trade Act (WpHG) issuers must immediately publish any information that (a) comes within their sphere of activity and (b) is not publicly known, if such information is likely to exert influence on share price. The vast majority of ad hoc news in Germany is published via the systems of DGAP (Deutsche Gesellschaft für Ad hoc Publizität), which transfers the notifications on behalf of the responsible stock listed company immediately to information service providers such as Bloomberg, dpa-AFX, Reuters, Thomson Financial, or vwd.

The sample consists of all interorganizational cooperative agreement ad hoc notifications issued by German stock listed companies between September 1999 and December 2007. Relevant notifications were collected from the dpa-AFX archive accessible via the LexisNexis interface using search terms referring to different terms of interorganizational cooperative agreements and a set of delimiters to exclude confounding events a priori. The query yielded 2.457 noti-

fications. We reduced them on announcements which are exclusively concerned with interorganizational cooperational agreements. Additionally, notifications experiencing confounding events in the event period were eliminated from the sample (McWilliams & Siegel 1997). The resulting sample consists of 692 ad hoc notifications.

For each event, time measured in days was adjusted applying the following conventions: the event day is denoted as day 0. The following (previous) day is denoted day +1 (-1) and so on. In this study the estimation period for purposes of OLS regression is 200 days, reaching from 211 to 11 days prior to the event, which is sufficient according to the analyses of Corrado & Zivney (1992) and Armitage (1995). A time period of ten days between the event and the estimation period is used as buffer period to limit any event induced influence on the estimation period; e.g. caused by insider activities. 71 announcements had to be excluded from the sample when using a 200-trading-day estimation period because of missing data; i.e. when less than 200 trading days were available. Hence, the final sample consists of 621 ad hoc notifications. All events in the sample were allocated to one of the different cooperation types to be analyzed in this study. The distribution of the announcements classifications is given in Table 1.

Table 1. Distribution of cooperation types (final sample $n = 621$)

Institutional scope	<i>n</i>	%
Contractual partnership	232	37,4%
Majority participation	250	40,3%
Minority participation	86	13,8%
Joint venture	53	8,5%
Total	621	100%

Additionally, the distribution of events over time is presented in Table 2.

Table 2. Distribution of announcements over time (final sample $n = 621$)

Year	<i>n</i>
1999	9
2000	18
2001	145
2002	95
2003	52
2004	48
2005	82
2006	72
2007	100
Total	621

Methodology

Event study methodology requires measurement of abnormal returns, which are defined as difference between the actual ex post return during the event period and that which would have been expected in the absence of the event which has to be predicted considering a model generating expected returns (Brown & Warner 1980, 1985). The standard approach generating expected returns is based on estimating a “market model” for each firm (Sharpe 1963, McWilliams & Siegel 1997):

$$R_{it} = \alpha_i + \beta_i \cdot R_{mt} + \varepsilon_{it},$$

where: R_{it} = the rate of return on the share price of firm i on day t ,

R_{mt} = the rate of return on a market portfolio of stocks on day t ,

α_i = intercept parameter of the linear relation,

β_i = slope parameter of the linear relation (systematic risk of firm i),

ε_{it} = the error term, with $E[\varepsilon_{it}] = 0$.

The DAX30 was chosen as the relevant market index for each firm. All stock return data were obtained from Thomson Datastream financial database. The parameters are estimated using ordinary least squares (OLS) regression of R_{it} on R_{mt} over a given estimation period preceding the event (Brown & Warner 1985, Strong 1992). The abnormal return for any stock i is calculated for the event period using the estimated regression coefficients:

$$AR_{it} = R_{it} - (\hat{\alpha}_i + \hat{\beta}_i \cdot R_{mt}),$$

The daily average abnormal return of all events of interest from a sample is calculated as:

$$\overline{AR}_i = \frac{1}{N} \sum_{i=1}^N AR_{it}.$$

The cumulative average abnormal return (CAR) is the sum of the average abnormal returns from equation (3) over any given event period $\{\square \square \square \square \square \square \square \square \square\}$:

$$CAR = \sum_{t=\alpha}^{\omega} \overline{AR}_i.$$

For this study the length of the event period is set to

three days: the day of the announcement plus the day before and the day after. The day before is included to capture potential information leakage to the market in advance of the formal ad hoc notification, whereas the day after is involved in order to account for potential information processing inefficiencies and to capture the stock price effects of announcements which occur after the stock market closes on the event day (McWilliams & Siegel 1997). Obviously, the shorter the event period the easier it is to control for confounding events during the event period.

The null hypothesis states that the mean abnormal returns of a single day of the event period, or the cumulative average abnormal returns (CAR) for the whole event period respectively are not significantly different from zero. This hypothesis is tested by performing a t -test (test statistic TS_1) as proposed by Hendricks & Singhal (2003). As this test statistic tends to be sensitive to outliers, McWilliams & Siegel (1997) suggest the additional use of nonparametric tests. In this study the Wilcoxon signed-rank test (test statistic TS_2) is conducted as described in Lehmann (1975). Corrado’s (1989) nonparametric rank test (test statistic TS_3) is executed as an alternative nonparametric test (see also Cowan 1992). According to our hypotheses, all tests are conducted as one-sided tests in order to show that mean and median abnormal returns are significantly above 0%.

Results

The results for testing the value creation potential of interorganizational cooperational agreements (hypothesis 1) are reported in Table 3 (Panel a). For the event day we find a mean abnormal return of 2.07%. All tests for $t=0$ are highly significant and strongly support hypothesis 1. The median abnormal return is 0.22%, which suggests that the mean abnormal return may be influenced by outliers. The abnormal returns for the complete event period $[-1; +1]$ are also highly significant, whereas for day -1 only the t -statistic indicates a significant abnormal performance. Day +1 shows no significant abnormal return at all. Nevertheless, these findings support the semi-strong form of market efficiency (Fama 1970, Fama 1991). For a corresponding plot see Figure 2. (4)

Insert Figure 2 here

Table 3. Abnormal and cumulative abnormal returns (total sample and subsamples)

Continuing with minority partnerships we receive a somewhat unclear result. While we find a significant positive mean (median) abnormal return of 0.67% (0.13%) for the event day, negative mean and median abnormal returns the days preceding and succeeding the event day exceed the events day abnormal return and entail a negative impact on firm value during the event period (Table 3 (Panel c)). Majority participations yield to highly significant mean abnormal returns of 1.67% on the event day and 1.95% for the event period. However, Corrado's rank test does not point at a significant reaction on any time frame considered (Table 3 (Panel d)). Joint venture formation shows highly significant mean abnormal returns of 2.68%, regarding the event period (Table 3 (Panel e)). Besides a high significant positive mean abnormal return on day 0 and +1 the mean abnormal return of day -1 is of lower significance. For corresponding CAR-plots concerned with different the types see Figure 3.

Panel (a) Abnormal and cumulative abnormal returns (total sample)

	t = -1		t = 0		t = +1		[-1; +1]	
Mean AR	0,49%		2,07%		-0,08%		2,48%	
TS ₁ (p-value)	3.316***	(0.000)	12.789***	(0.000)	0.735	(0.231)	9.723***	(0.000)
Median AR	-0,05%		0,22%		-0,10%		0,72%	
TS ₂ (p-value)	0.105	(0.458)	7.710***	(0.000)	-0.837	(0.799)	6.163***	(0.000)
TS ₃ (p-value)	0.507	(0.306)	1.671**	(0.047)	0.165	(0.435)	1.353*	(0.088)

Panel (b) Abnormal and cumulative abnormal returns (contractual partnership)

	t = -1		t = 0		t = +1		[-1; +1]	
Mean AR	0,97%		3,32%		-0,19%		4,10%	
TS ₁ (p-value)	4.060***	(0.000)	12.158***	(0.000)	-0.079	(0.532)	9.318***	(0.000)
Median AR	0,11%		0,80%		-0,31%		2,36%	
TS ₂ (p-value)	1.385*	(0.083)	7.301***	(0.000)	-1.535	(0.938)	6.120***	(0.000)
TS ₃ (p-value)	1.204	(0.114)	3.271***	(0.001)	-0.561	(0.713)	2.260**	(0.012)

Panel (c) Abnormal and cumulative abnormal returns (minority participation)

	t = -1		t = 0		t = +1		[-1; +1]	
Mean AR	-0,44%		0,67%		-0,72%		-0,49%	
TS ₁ (p-value)	-1.851	(0.968)	2.036**	(0.021)	-2.627	(0.996)	-1.410	(0.921)
Median AR	-0,16%		0,13%		-0,10%		-0,26%	
TS ₂ (p-value)	-1.681	(0.954)	1.871**	(0.031)	-0.691	(0.755)	-0.850	(0.802)
TS ₃ (p-value)	-0.787	(0.784)	-0.529	(0.702)	-0.320	(0.626)	-0.945	(0.828)

Panel (d) Abnormal and cumulative abnormal returns (majority participation)

	t = -1		t = 0		t = +1		[-1; +1]	
Mean AR	0,24%		1,67%		0,04%		1,95%	
TS ₁ (p-value)	1.623*	(0.052)	6.266***	(0.000)	1.456*	(0.073)	5.395***	(0.000)
Median AR	-0,06%		0,07%		0,00%		0,41%	
TS ₂ (p-value)	-0.552	(0.709)	2.905***	(0.002)	0.270	(0.394)	2.806***	(0.003)
TS ₃ (p-value)	0.429	(0.334)	0.790	(0.215)	0.745	(0.228)	1.134	(0.128)

Panel (e) Abnormal and cumulative abnormal returns (joint venture)

	t = -1		t = 0		t = +1		[-1; +1]	
Mean AR	1,06%		0,75%		0,87%		2,68%	
TS ₁ (p-value)	1.689**	(0.046)	2.138**	(0.016)	2.868***	(0.002)	3.865***	(0.000)
Median AR	0,01%		0,42%		0,33%		0,80%	
TS ₂ (p-value)	0.438	(0.331)	1.828**	(0.034)	1.377*	(0.084)	2.306**	(0.011)
TS ₃ (p-value)	0.195	(0.423)	1.076	(0.141)	1.476*	(0.070)	1.586*	(0.056)

* / ** / *** significant at 0.1 / 0.05 / 0.01 level

Insert Figure 3 here

Comparing the different institutional scopes among each other using a two-sample t-test, the results for event day 0 indicate that contractual partnerships have significantly higher abnormal returns than the other institutional scopes (Table 4).

Table 4. Comparison of institutional scopes $t = 0$

	Contractual partnership	Majority participation	Minority participation	Joint venture
Contractual partnership		1.836** (0.033)	4.157*** (0.000)	3.796*** (0.000)
Majority participation	-1.836 (0.967)		1.154 (0.124)	1.027 (0.152)
Minority participation	-4.157 (1.000)	-1.154 (0.876)		-0.125 (0.550)
Joint venture	-3.796 (1.000)	-1.027 (0.848)	0.125 (0.450)	

* / ** / *** significant at 0.1 / 0.05 / 0.01 level

Testing for the event period we find contractual partnerships CARs significantly higher compared to minority or majority participations, and majority participations CARs higher than minority participations (Table 5).

Table 5. Comparison of institutional scopes $t = [-1; +1]$

	Contractual partnership	Majority participation	Minority participation	Joint venture
Contractual partnership		2.236** (0.013)	4.492*** (0.000)	0.945 (0.172)
Majority participation	-2.236 (0.987)		2.288** (0.011)	-0.476 (0.683)
Minority participation	-4.492 (1.000)	-2.288 (0.989)		-2.015 (0.978)
Joint venture	-0.945 (0.828)	0.476 (0.317)	2.015** (0.022)	

* / ** / *** significant at 0.1 / 0.05 / 0.01 level

We can hold, that the results of our empirical tests have confirmed our hypotheses.

A sensitivity analysis was conducted in order to check the results for robustness under alternative methodical settings. Initially R_{it} and R_{mt} are calculated as discrete returns. Using logarithmic returns leads to lower levels of mean abnormal returns. But no noticeable differences in the significance levels are observed in our sample. Furthermore, we initially used the DAX30 as market index in order to calculate normal returns. Using the CDAX which is a much broader market index changes neither the magnitude of abnormal returns, nor the significance levels (results not reported here).

Discussion

We are able to show a general relationship between ad hoc notifications of interorganizational cooperational agreements for the German stock market, resulting in a mean abnormal return of 2.07%. This result is according to previous empirical studies concerned with the US stock market. As comparable studies do not deal

with different forms of institutional agreements in particular, our study is the first one – not only for the German stock market – that goes beyond.

Interorganizational cooperational agreements differ in the extent of interorganizational dependence or the degree of hierarchical control respectively (Pfeffer & Nowak 1976, Gulati & Singh 1998). Resource dependence theory focuses on resources a firm must obtain from external sources to survive or prosper. Tightly coupled agreements, such as majority investments or joint ventures, are those in which the organizations are linked together by equity stakes as well as formal structures. In contrast, loosely coupled agreements may involve less structure and no equity stakes. Hence, participating in interorganizational agreements obviously offers different ways for firms to gain access to critical resources and thereby reduce their dependence relative to other organizations (Pfeffer & Salancik 1978). Somewhat surprisingly, we find that contractual partnerships, the form with the lowest extent of interorganizational dependence, yield the highest abnormal returns compared to minority and majority participations, although non-equity agreements lack many of the benefits of shared equity cooperation forms because partners rarely pool their resources and

efforts in cooperative agreements in the way that they do when equity is involved. Furthermore, our results indicate a u-shaped relationship between equity ties and value creation as solely contractual cooperations as well as majority participation show higher abnormal returns compared to minority participations. Considering joint ventures as a special form, our results confirm their value creation potential and extend existing research by examining the participation of German firms.

Presumably, equity stakes do not necessarily stand for better cooperation per se. Speculating on potential causes, one reason might be the organizational flexibility provided by non-equity agreements: links to partners can be formed or disbanded quickly in response to market demands. Furthermore, contractual partnerships seem easier to terminate as no equity is involved. Second reason could be that investors can buy a company's equity, but not "the mind or the spirit or the initiative or the devotion of its people" (Ohmae 1989, p. 148). A third reason could be the non-value maximizing behavior by the equity holder's management, when seeking to maximize growth in sales or to control a larger firm (Halpern 1983). Therefore, a key issue in equity stakes is how to allocate control among the investment held, which serves as a fourth reason. Exercise of influence is typically realized by the investing partner joining the other partner's supervisory board and therefore acting as principal. Hence, agency aspects can play a major role as it is concerned with the separation of ownership and control and the hazard of resulting suboptimal management decisions from the perspective of shareholders under certain circumstances; e.g. different goal systems between central instance (principal) and decentralized decision maker (agent), self-interested behavior, bounded rationality, risk aversion and asymmetrical information (Jensen & Meckling 1976). Our empirical results are in line with the theoretical expectation that this effect would be more serious for minority compared to majority participations, which allows relatively better control. Furthermore, hazards of equity stakes might occur, when there is pressure from capital markets or parent firms to get cash flows back fast.

Conclusion

This event study is the first one for the German stock market testing the general relationship between ad hoc notifications of interorganizational cooperational agreements as well as different types of institutional agreements and stock market response. Our results suggest that interorganizational cooperational agreements in general lead to significant increase of shareholder value; at least in the short term. Analyzing different types of interorganizational cooperational agreements, we find that notifications of contractual partnerships yield the highest abnormal returns compared to other forms containing equity stakes. Obviously, shareholders do not necessarily relate better control of interorganizational cooperations to owner-

ship. However, the study dealt with stock market reactions to announcements of corporate decisions and not to the outcomes of those decisions. Further research could examine if these wealth gains for shareholders linked to the announcement of an interorganizational cooperational agreement are justified in the long term.

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Figures

Figure 1. Taxonomy of interorganizational cooperative agreements

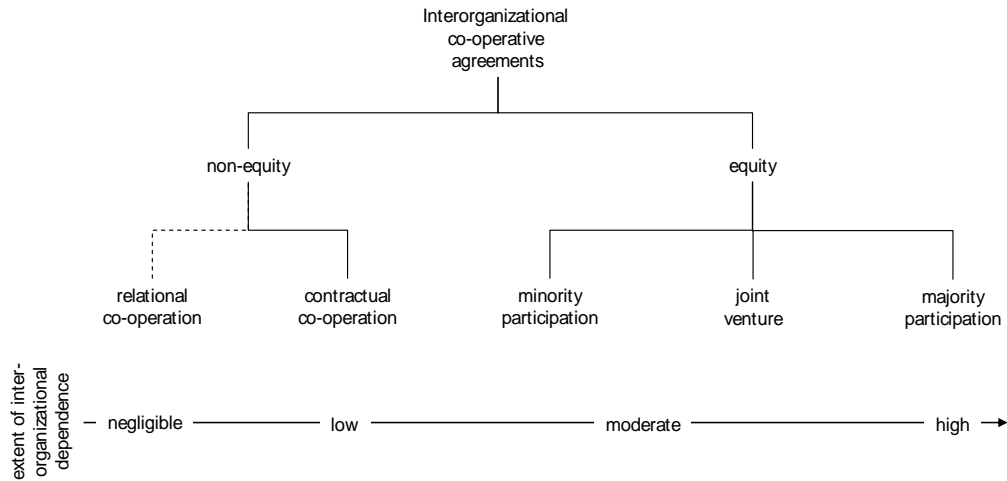


Figure 2. Plots of cumulative abnormal returns (CAR) over time (total sample)

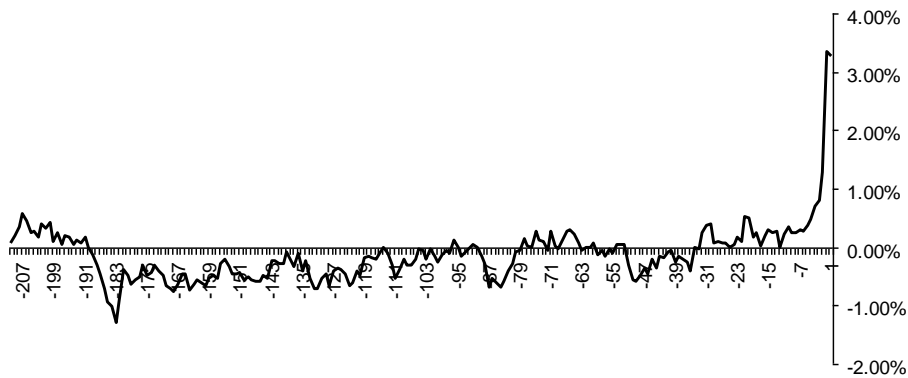


Figure 3. Plots of cumulative abnormal returns (CAR) over time (subsamples)

