4 Value creation in alliances – a meta-analysis

Prior research on the relationship between alliance activities and shareholder value creation has produced varying results; furthermore, a systematic review of past research based on quantitative methods is lacking for alliances. The major aim of this chapter, therefore, is to integrate previous empirical research on shareholder value creation in alliances via a meta-analysis.

The theoretical background of past research on the link between value creation and alliances is summarized and on the basis of the underlying theories several hypotheses concerning this relationship are derived; the hypotheses are then empirically tested via meta-analytic techniques and general conclusions and suggestions for future research are presented.

4.1 Introduction

The importance of co-operative mechanisms in today's business environment has led a steadily growing number of researchers to examine the relationship between alliance activities and shareholder value creation. The issue has been addressed in both strategic management (e.g., Das et al., 1998; Koh and Venkatraman, 1991) and financial economics literature (e.g., Chan et al., 1997; Chang and Huang, 2002) with varying outcomes. Some studies find that alliances create value for the participating firms (e.g., Chan et al., 1997; McConnell and Nantell, 1985), while others do not (e.g., Chung et al., 1993; Finnerty et al., 1986). Furthermore, those studies that do identify a positive relationship between alliance activities and shareholder value creation are inconsistent in identifying the conditions under which value creation in alliances occurs; most empirical studies have only investigated a small number of variables and often focus on new effects instead of integrating factors that have been previously confirmed to influence shareholder value creation.

A number of researchers have looked at the differential benefits firms receive from the various types of alliances (e.g., technological vs. marketing); other factors that have previously been investigated include partner size, industry relatedness of partners, previous co-operation experience, and location of partners. The vast majority of studies considered the impact of joint ventures on the performance of firms, many of them in an international context; the results of these joint venture studies are heterogeneous. Joint ventures represent just one form of alliances, but there are various other types of co-operative mechanisms that are also worth looking at in more detail. So far, few studies have examined the different benefits firms receive from joint ventures as well as contractual alliances. Accordingly the empirical analysis in this chapter should not only investigate the general alliance-firm

performance[14] relationship, but also analyze performance differences between the two alliance types, namely joint ventures and contractual alliances.

Given the number of empirical studies addressing the subject and the diversity of results, the need for a comprehensive analysis of past research is self-evident; a systematic review and consolidation of previous research, based on quantitative methods, is currently lacking. In light of the shortcomings of traditional narrative reviews and vote-counting methods (Hunter and Schmidt, 1990), meta-analysis is seen as the appropriate method in order to statistically integrate results across these studies.

With this in mind, two main questions are addressed in the following:

1. Do alliances create value, as measured by the stock market, for the firms forming them?[15]
2. Which determinants influence value creation in alliance activities?

4.2 Theoretical background and hypotheses

The overall effect on value creation

Transaction cost theory, theories of strategic behavior, and the theory of organizational knowledge and learning are the most frequently applied theories in explaining the rationale for and the benefits and costs of alliances. According to transaction cost theory, an alliance might positively relate to performance if the transaction and production costs in an alliance are less than those of other modalities, such as intra-firm and market coordination (Hennart, 1988). According to the theories of strategic behavior, an alliance may increase a firm's value if it improves the parent firm's competitive position vis-à-vis rivals (Kogut, 1988). Further arguments in favor of value creation through alliances are provided by the theory of organizational knowledge and learning, which views alliances as a means by which firms can learn and develop new skills or seek to retain their existing capabilities (e.g., Contractor and Lorange, 1988 or Kogut, 1988).

Most empirical studies on value creation through alliances consider only one of the various theoretical perspectives and fail to integrate complementary explanations of shareholder value creation. Furthermore, some financial economics and strategic management scholars base their explanations solely on "synergy arguments" derived from the M&A literature, according to which the pooling of resources or the transfer of capabilities in an alliance creates value in a way that each of the parents could not achieve by acting alone (Inkpen, 2001).

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[14] Where firm performance refers to the stock market appraisal of a specific alliance announcement

[15] The author investigates the performance consequences of individual alliances for the firms that form them and not the performance of the alliances themselves (see also Gulati, 1998a).

In general, the main explanations for value creation through co-operative agreements are: increased operational efficiency (Sirower, 1997), reduced transaction costs (Hennart, 1988), risk reduction and stability (Kogut, 1991), access to another firm's organizational knowledge (Lyles and Salk, 1996) and resources (Pisano, 1990), creation of alliance routines (Powell et al., 1996), reduced competition—or increased market power (Harrigan, 1985), circumvention of government restrictions on entering new markets (Contractor, 1990), better alignment of decision-making authority with the requisite decision-making knowledge (Jensen and Meckling, 1991), and greater organizational flexibility—and thus a more rapid means of competitive repositioning (Porter and Fuller, 1986). Increases in operational efficiencies can result from economies of scale achieved by the pooling of economic activities via alliances and can lead to value creation when the achieved reduction in costs is higher than the costs incurred in the formation of the alliance. According to Hennart (1991), joint ventures are efficient if two conditions are met: "markets for the intermediate goods held by each party are failing" and "acquiring or replicating the assets yielding those goods is more expensive than obtaining a right to their use through a joint venture agreement." This argument can be applied to all types of alliances; as compared to other organizational modes, such as simple market transactions, a decrease in monitoring costs may be realized, as all partners ought to be interested in a positive alliance outcome. Risk reduction can be achieved by portfolio diversification, dispersion of cost, and cost sub-additivity; sub-additivity here refers to reductions in total investment costs achieved by combining the know-how and unused or under-used facilities of an alliance's parent firms (Kogut, 1991). Often the partners' combined experience and sharing of markets will result in a faster entry into new markets and a quicker payback of initial investments (Contractor and Lorange, 1988). By forming an alliance, a partner ultimately gains access to another firm's organizational knowledge, skills (Kogut, 1988), and complementary resources (Pisano, 1990), as well as access to external legitimacy and status (Baum and Oliver, 1991). Firms may also develop alliance routines that bring new resources from external sources into the firm (Powell et al., 1996); these alliancing processes for accessing outside knowledge can be viewed as a dynamic capability (Eisenhardt and Martin, 2000) and thus a driver of firm performance. Moreover, alliances can reduce competition and improve the bargaining power of the parent firms; an alliance may also be the only way to enter a market that has government-mandated investment or trade barriers imposed on it (Contractor and Lorange, 1988). A further argument in favor of value creation through alliances is that they provide a means of creating an organizational mechanism which better aligns decision-making authority with the knowledge or expertise needed to make a certain decision (Jensen and Meckling, 1991); decision responsibilities for each partner can be clearly defined and the transfer of know-how and the pooling of resources facilitated. Costs of knowledge transfer might therefore be lower than, for example, in simple market transactions. Finally, alliances can add value through organizational flexibility, as they make it possible for

the parent firms to respond quickly to changing demands in the marketplace (Chan et al., 1997). The first hypothesis therefore is:

H1: Alliances lead to shareholder value creation for the participating firms.

Factors influencing value creation

A review of past empirical studies on value creation in alliances primarily reveals the following factors: industry relatedness of partners (e.g., Chan et al., 1997; Wang and Wu, 2004), partner size (e.g., Das et al., 1998; Mc Connell and Nantell, 1985), partner location (e.g., Cheng et al., 1998; Meschi and Cheng, 2002), and marketing versus technological alliances (e.g., Koh and Venkatraman, 1991; Neill et al., 2001); differences in value creation between joint ventures and contractual alliances are also examined in the following. The potential moderating variables noted above are derived from underlying theory. Other variables that have been studied so far include, for example, previous alliance experience (e.g., Chang and Huang, 2002), size of investment (e.g., Chen et al., 1991), free cash flow (Min and Prather, 2001), and ownership (Cordeiro, 1993); however these factors have not been examined in a sufficient number of previous studies in order to systematically examine their impact in a meta-analysis.[16]

Joint ventures versus coordinated ventures

To differentiate between various forms of alliances, the classification in figure 8 was developed; alliances are thus broken down into ventures with joint activities (VJA) and ventures with coordinated activities (VCA). Those types of alliances not involving the creation of a separate legal entity are generally referred to as "contractual alliances." The author distinguishes here between "contractual co-operation" through coordinated activities only and "contractual co-operation" in which a new organizational entity is created; in this latter instance, the conjunct value chain activities are managed by a separate organizational entity.

[16] Those variables common to three or more primary studies that use the same performance variable were examined; although there are no specific guidelines, three empirical studies is seen as a reasonable minimum number of samples in order to test the impact of a certain factor in a meta-analysis (Dalton et al., 2003; King et al., 2004).

Figure 8: Forms of alliances

<table>
<tr><td colspan="3">Alliance
= a conjunction, in either a joint or coordinated manner, of value chain activities of two or more firms that is based on a relationship between them</td></tr>
<tr><td rowspan="2">Equity joint venture

Separate legal and organizational entity</td><td colspan="2">Contractual alliances</td></tr>
<tr><td>Separate organizational entity</td><td>Coordinated value chain activities solely</td></tr>
<tr><td colspan="2">Venture with joint activities (VJA)
- Joint ventures -</td><td>Venture with coordinated activities (VCA)
- Coordinated ventures -</td></tr>
</table>

Source: author

The issue of choosing between joint ventures and coordinated ventures can be approached by means of transaction cost theory (e.g., Williamson, 1975 or Pisano and Teece, 1989). Alliance partners often tend to behave opportunistically by maximizing their own benefits and not those of the co-operative venture. Hennart (1988) argues that such opportunistic behavior results in high negotiating and monitoring costs; it is thus a major source of transaction costs in business alliances. If the partners share the ownership of a separate legal entity or have a joint organizational entity, however, the incentive for opportunistic behavior is likely to decrease (Pisano and Teece, 1989), because of a stronger alignment of interests, monolithic control, and diminished performance ambiguity (Das and Teng, 1996). Hence, joint ventures can control opportunism and therefore reduce transaction costs of alliances; simple contractual agreements, however, lack such a mechanism for controlling opportunistic behavior. Although joint ventures are accused of having higher agency costs, associated with management's reluctance to release resources under their control, once the need for those resources has diminished (Jensen, 1986) it can be hypothesized that:

H2: Shareholder value creation is greater in joint ventures than in coordinated ventures.

Horizontal versus non-horizontal alliances

The relatedness of the partner firms is often assumed to influence the alliance-firm performance relationship (e.g., Johnson and Houston, 2000 or Mohanram and Nanda, 1995). Horizontal alliances are defined as alliances that take place in the same industry or production stage whereas non-horizontal alliances are either vertical alliances or alliances of partners from different industries. The argument in favor of value creation in horizontal alliances mainly follows the synergy concept often used in M&A studies. Potential sources of value creation in horizontal alliances are said to be collusive as well as operational synergies, e.g., increased market power through collusion or economies of scale in production and distribution or synergistic advantages through the exploitation of complementarities; furthermore, synergies might also be found in the exploitation of asymmetric managerial skills. While it can be argued that such asymmetries can also occur in non-horizontal alliances, operational synergies are not likely to be realized in non-horizontal alliances.

It should also be noted, that the common basis upon which the sharing of skills and know-how can be developed is significantly smaller in non-horizontal alliances. If the involved partners come from a related business, they have a higher understanding of the operational context and of the need for certain courses of action, and thus might be able to work together more effectively.

When the costs of valuing and acquiring complementary assets are high and information asymmetries are severe, alliances might be superior to other modes of governance between market and hierarchies (Balakrishnan and Koza, 1993). Investors will expect greater gains if the partners come from unrelated businesses where they are not able to appraise the value of each other's assets; however, potential costs and difficulties due to problems of strategic and organizational compatibility in non-horizontal alliances might be negatively viewed by the stock market. The third hypothesis is therefore:

H3: Shareholder value creation is greater in horizontal alliances than in non-horizontal alliances.

International versus national alliances

FDI theory proposes several advantages for international alliances. First, entering an international business co-operation allows a company to jointly setup and/or exploit monopolistic advantages over firms in foreign countries (Hymer, 1960). Second, vertical and horizontal integration in foreign countries allows a firm to capture the rent which could be exploited from the imperfect factor and product markets (Kahley, 1987). Finally, diversification of a firm's businesses abroad can lead to risk reduction that is achieved through a reduction of the volatility of a company's earnings (Rugman, 1976).

The positive multinational network hypothesis predicts that expanding into a new geographic market will benefit shareholders' wealth (Brewer, 1981). Kogut (1983) argues that the multinational firm profits from establishing a globally maximizing network; the expansion of a firm's global network through an international alliance provides a multinational corporation with valuable options, for example, reducing tax payments through intra-firm financial transactions and reducing manufacturing costs by shifting production to countries with lower material and labor costs. Moreover, through an international alliance, at least one firm obtains immediate access to a foreign market and can profit from the existing network of the local partner(s) and reduce its liabilities of foreignness (e.g., Zaheer and Mosakowski, 1997). The involved partners can also achieve greater flexibility in the transfer of resources across borders.

The learning theory (Johanson and Vahlne, 1977, 1990) postulates, furthermore, that internationalization is an incremental learning process not available to domestically operating firms (Hamel, 1991); the knowledge acquired in the process of internationalizing a firm may

allow generating competitive advantages vis-à-vis competitors. Proponents of the learning theory also point to possible negative effects on value creation in international alliances; these are primarily seen in the complexity of managing widespread business units, which often arises due to differences in national and corporate cultures; however, such cultural differences are also relevant in national alliances. In light of these arguments, the fourth hypothesis is therefore:

H4: Shareholder value creation is greater in international alliances than in national alliances.

Smaller versus larger partner in an alliance

According to the relative-size hypothesis (McConnell and Nantell, 1985), the relative excess return of the smaller partner should be greater than that of the larger partner. By entering into a co-operative agreement, smaller firms are able to acquire knowledge, skills, and other resources that may otherwise be difficult to obtain or gain access to. For small- and medium-sized enterprises in particular, which often lack knowledge of foreign markets, alliances greatly facilitate initial expansion into foreign markets and allow important time savings in entering new markets or building an international presence; additionally the fact that a smaller firm is able to attract the attention of a (much) larger alliance partner can lead to higher value creation for the smaller partner due to the positive signal it sends to investors (Mohanram and Nanda, 1995).

Larger firms usually seek out smaller firms for their know-how; this also makes them attractive to other firms. Therefore the relative bargaining power of the smaller partner in an alliance will be significantly higher than that of the larger partner (Das et al., 1998). Therefore, the following hypothesis is proposed:

H5: Shareholder value creation is greater for the smaller partner in an alliance than for the larger partner.

Alliances between firms from developed and emerging countries

The author differentiates between those partner firms from developed and those from emerging-market countries; the developed countries here include the industrialized countries of Western Europe, North America and Japan. Parent firms from the four “Asian-tiger” states, as well as from China and Eastern Europe, are classified into the emerging market group.

When a firm from a developed country enters an alliance with a partner from an emerging market, it is usually seeking to acquire local market knowledge and business information—for instance, on economic conditions, the legal framework and political situation, sources of material and financing, distribution channels, customer segments, etc. (e.g., Beamish, 1984)—

or it may be trying to benefit from environmental factors such as low labor costs; the alliance mode may also be the only way to access a specific market due to government restrictions. Firms from developed countries are probably also attracted by high growth rates in emerging-market countries as well as by incentives provided by host governments, such as preferential tax treatments. Another advantage could be a clear role allocation in such ventures, as firms from developed countries, which usually have superior managerial skills and technological know-how, generally claim leadership.

Nevertheless, firms from developed countries face large risks when joining together with firms from emerging markets. These countries are often subject to social unrest, political instability, high inflation rates, and currency depreciation; business in these markets may also be hindered by various bureaucracies and government restrictions (e.g., Hoskisson et al., 2000). In light of these issues, the market likely does not consider such ventures to be more value enhancing than alliances between firms from developed countries. Accordingly, the next hypothesis is:

H6: For firms from a developed country, whether they form an alliance with a partner from an emerging market country or an alliance with a partner from a developed country has no significant effect upon shareholder value creation.

Marketing versus technological alliances

With respect to the value-chain activities of a firm, co-operative marketing and technological ventures are two of the most popular types of alliances.[17] Marketing alliances involve joint activities in downstream value-chain activities such as sales, distribution, and customer service, whereas technological alliances comprise joint activities in R&D, engineering, and manufacturing (Hagedoorn, 1993).

Technological alliances, which often involve the production and sharing of knowledge, may help to reduce costs since they diminish the problems inherent in knowledge—namely externality and attenuation of property rights, which lead to high costs in market-based transactions. They further help firms to protect knowledge from expropriation and to ease the transfer of tacit knowledge (Das et al., 1998).

Joint development of new technologies also has the potential for cost savings as the usually large block of fixed costs may be reduced by means of economies of scale and scope, shared overhead, and sub-additivity of the capital cost of equipment (Contractor and Lorange, 1988). In addition, product development cycles can be shortened and the contingency risk of new technological developments can be shared; alliances may also be the only way to gain access to certain technological innovations.

[17] Hagedorn (1993) found that technology, R&D, and marketing are the three dominant motives for forming alliances.

Marketing alliances are primarily pursued in order to enter new markets or new customer segments and to acquire local market know-how. Learning effects and the stimulation of demand are usually the main reasons for entering marketing alliances; they are frequently formed when a product enters the mature or declining phase of its life cycle, and consequently this might send a signal of weakness to the market, as investors may well believe that the company is entering maturity or decline and that there is thus less time to capture the benefits (Das et al., 1998); as a result, such marketing alliances could be associated with a decrease in firm value. Therefore hypothesis seven is:

H7: Shareholder value creation is greater in technological alliances than in marketing alliances.

4.3 Method

Meta-analysis is a research approach in which the results from many primary empirical studies examining relationships between similar variables are systematically integrated. Unlike a narrative review, meta-analysis offers the opportunity not only to systematically quantify the relationship between co-operative ventures and value creation, but also to account for sampling error, an important source of artificial variance. Meta-analysis has been applied above all in medical and psychological research. In the field of management, meta-analytical reviews have been primarily conducted in the areas of organization theory (e.g., Ketchen et al., 1997), marketing (e.g., Assmus, Farley and Lehman, 1984), and more recently, in strategic management (e.g., Bausch and Krist, 2007). The majority of meta-analyses in business administration rely on the descriptive methods provided by Hunter et al. (1982) and Hunter and Schmidt (1990), and these methods have also been applied in this paper.

The main purpose of combining and integrating study results is to determine an average effect size across the studies either for the entire sample or for subsamples in order to identify moderators. Hunter and Schmidt show that the best estimate for the population correlation (ρ) is the weighted average correlation ($\bar{r}$) in which each correlation is weighted by the individual study size:

$$\bar{r} = \frac{\sum \left[N_i \; r_i \right]}{\sum N_i} \qquad (1)$$

with r_i as the correlation in study i and N_i as the number of observations in study i (Hunter and Schmidt, 1990). In calculating the r-statistic a variety of procedures have been used. Where data on effect sizes, e.g., zero-order correlations or d-statistics, of alliance and performance measures were not provided but the results of statistical tests were reported (e.g., t-test, F-

test), formulas given by Glass et al. (1981) and Hunter et al. (1982) were used to transform the significance tests into the *r*-statistic.

Correspondingly, the observed variance across studies (s_r^2) is determined by the weighted average squared difference between the observed correlations and the weighted average correlation:

$$s_r^2 = \frac{\sum \left[N_i \ (r_i - \bar{r})^2 \right]}{\sum N_i}. \qquad (2)$$

However, studies are never perfect. Hunter and Schmidt (1990) ascertained eleven artifacts that can influence effect sizes. Due to the lack of available data, the author has only been able to deal with sampling error—which, incidentally, accounts for most of the variability in effect sizes resulting from artifacts. This is assuming a reliability of 1.0 and no range restriction.[18]

If the observed variance can be totally attributed to sampling error, the homogeneity of the sample is obvious; however, a residual variance often remains in the sample; this can be either a result of heterogeneity in the sample and thus an indicator of the existence of a different population or a result of remaining, uncorrected artifacts. It is therefore necessary to test for homogeneity; commonly accepted tests nowadays include credibility intervals and the 75% rule in accordance with Hunter and Schmidt.

Credibility intervals are generated around the weighted corrected average correlation using the corrected standard deviation (s_ρ). If the interval is large or includes zero, there is a high probability that several subpopulations exist; correspondingly, small credibility intervals not including zero indicate that the weighted average correlation is the best predictor of a single homogenous population (Whitener, 1990). Koslowsky and Sagie (1993) suggest on the basis of an empirical test a threshold of 0.11 to separate small from large credibility intervals.

The 75% rule tests the homogeneity of the included studies by comparing the sampling error variance to the observed variance. If the sampling error variance is larger than 75%, Hunter and Schmidt conclude, the source of the remaining unexplained 25% of the observed variance can be expected to be uncorrected artifacts and thus the population can be assumed to be homogenous (Hunter and Schmidt, 1990; Schmidt et al., 1988).

If the total sample is found to be heterogeneous, a search for moderators is initiated; these moderators are derived from the underlying theories relevant to the topic under consideration. In a next step, the total sample is divided into subsamples according to the moderators and separate meta-analyses can be performed for each subgroup. A moderating variable can be confirmed when the weighted average correlations differ in the two subgroups and the

[18] Event studies examining value creation from alliances rely on independent and dependant variables as observed and do not assume any error.

average residual variance is smaller than in the total sample (Hunter and Schmidt, 1990). To verify the significance of the differences between the two subgroups a *z*-test was applied, and 95% confidence intervals were calculated to check the significance of the findings; a 95% confidence interval that does not include zero is an indicator that there is a true relationship between the variables (Hunter and Schmidt, 1990).

4.4 Sample

The population of studies that examine the issue of shareholder value creation in alliance activities by using the event study methodology has been identified by using multiple searching techniques. Event studies are based on the assumption that in an efficient market the immediate wealth effect reflects the capital market's overall unbiased assessment of the present value of the future benefits of the alliance. Thus, short-term as well as longer-term impacts of the alliance are included.[19]

The event study method involves estimating the abnormal returns to the parent company's common stockholders after the stock price has adjusted to reflect the new information revealed by the alliance announcement (Fama et al., 1969). The abnormal return for each security is measured by the deviation of the security's realized return from an expected return generated by the market model over a certain event period (Brown and Warner, 1985).

In identifying the studies for inclusion in the meta-analysis, the author first initiated a computer-aided, key word search of the Business Source Premier and ABI/Inform databases; the past issues of journals with a relatively high accumulation of relevant studies between 1985 and 2004 were then reviewed, and the reference sections of the collected studies were screened for additional studies. Finally, an Internet-based search via several search engines was performed in order to look for unpublished studies. This procedure offers reasonable assurance that all relevant studies were identified.

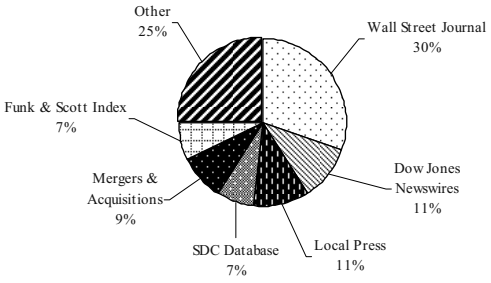
In order to be included, a primary investigation had to use either daily or monthly returns and the reported wealth effects had to be based on the announcement date of the alliance. Only studies published between 1985 and 2004 were included; where possible, a relatively narrow event window was selected (generally within two days of the announcement of the co-operative venture) in order that the influence of the alliance announcement on the stock market return shown be relatively precise and not influenced by other events. Ultimately, 40 relevant primary studies yielding 70 correlations for the meta-analysis with a total sample size of $N = 11{,}017$ were identified.

The 40 studies drew on 17 different sources for their samples and used different time periods as well as widely different sampling criteria. Figure 9 shows the primary data sources that

[19] Of course, when additional information about the alliances becomes known, the market assimilates it and the firm value may be further affected.

were used in the included event studies.[20] The time-span of the alliances that were studied ranges from 1969 to 2002. Samples that were used in multiple studies have been excluded; the observations can thus be treated as being independent of one another.

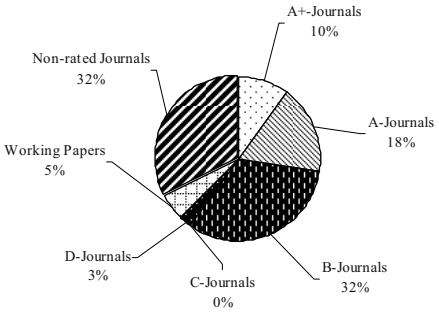
Figure 9: Data sources used in primary investigations



Source: author

Figure 10 gives an overview of the sources of the primary investigations that were included. The majority of the studies included are from A- and B-rated journals (60%), indicating high quality in the data basis; some non-published studies (5%) could also be included.

Figure 10: Sources of sample



A+ - top international journals with very high citation frequency and double-blind peer review
A - international journals with a high citation frequency and double-blind peer review
B - journals with at least supra-regional distribution with medium citation frequency and double-blind peer review
C - journals with at least national distribution, moderately refereed, and a rather low citation frequency
D - lower level national journals without formal reviewing procedures and a low citation frequency

Source: author

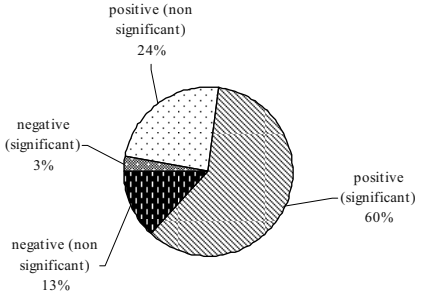
[20] Some studies used more than one primary data source.

The results of the studies were moderated according to the rating of the journals[21] in which they were published, and it was found that the journal rating has a strong moderating effect. The average r of studies published in A+ journals (K = 10, $\bar{r}$ = 0.238) was significantly higher than in A or B journals (K = 13, $\bar{r}$ = 0.120 and K = 8, $\bar{r}$ = 0.155). The difference between A+ journals and A journals is significant at the 5% level, whereas the difference between A+ journals and B journals is only significant at the 10% level. Studies published in non-rated journals (K = 24, $\bar{r}$ = 0.191) had a significantly larger average r than studies published in A journals. These results indicate a publication bias (see also Hunter and Schmidt, 2004).

To test for availability bias a file-drawer analysis was performed and Failsafe *N(x)* according to Rosenthal (1979) was calculated; this is the number of new, filed, or unretrieved studies averaging a z of zero that is required to bring the overall probability to any desired level of significance, usually p = .05. According to the calculated Failsafe N, 15,083 studies with effect sizes averaging zero would be necessary to make the findings insignificant ($p < 0.05$).

In order to draw initial conclusions at a more aggregate level, a vote-counting analysis of the identified primary empirical studies was conducted; figure 11 shows the heterogeneity of the results. Since 60% of the primary studies show a significant positive relationship, the vote counting analysis clearly seems to suggest a positive wealth effect for firms entering an alliance; however, only meta-analysis, which takes into consideration effect measures, sample sizes, and sampling error, can provide evidence on the magnitude of this relationship and moderating effects.

Figure 11: Vote-counting analysis – significance of results (5% level of significance)



Source: author

[21] To compile the journal rating, the following rankings were used as a basis: Social Science Citation Index impact factor (2002), Vienna University of Economics and Business Administration Journal Rating (2001), and a ranking by Tahai and Meyer (1999); the former ratings were taken from Harzing (2003); a ranking by the German Association of University Professors of Management (Hennig-Thurau et al., 2003) was also used, and if a journal was rated differently by different rankings, the weighted average was used.

4.5 Results

The results of the meta-analysis are presented in table 3. On the basis of the total sample, it can be concluded that firms benefit from entering alliances; there are small, but significant, positive value gains as measured by the abnormal returns in the stock market, thus confirming the first hypothesis. The weighted average correlation coefficient is $\bar{r} = 0.165$ and the 95% confidence interval does not include zero. Firms are obviously expected to be able to realize synergies in alliances and consequently to create value. The large number of studies that would be necessary to make this finding insignificant (15,083; $p < 0.05$) demonstrates the robustness of the results; the sample is found to be heterogeneous since the 75% rule is not fulfilled and the credibility interval includes zero and is relatively large. Therefore a search for moderators was initiated.

Consistent with prior reasoning, several potential moderating variables were tested; value creation is significantly positive for joint ventures ($\bar{r} = 0.151$) as well as contractual alliances ($\bar{r} = 0.179$). The second hypothesis, stating that value creation is higher in joint ventures than in contractual alliances, cannot be confirmed. The differences between the weighted average correlation of joint ventures and contractual alliances are very small; therefore the first condition for a moderator cannot be fulfilled. Furthermore, the *z*-score is insignificant and the average residual variance of the subgroups is larger than that of the entire sample. Neither of the subsamples is homogeneous; hence, it has to be concluded that the type of alliance (joint venture or contractual agreement) does not have a moderating influence on value creation in alliances.

In order to test hypothesis three, the sample was divided into horizontal and non-horizontal alliances; there are significant value gains in both subsamples, but none of the conditions for being a moderator is fulfilled. Although in the sample value creation is higher for horizontal alliances, the differences in effect sizes are not significant. Consequently the third hypothesis has to be rejected. In a second step, all vertical alliances were extracted from the non-horizontal subsample and compared to the horizontal alliances, but still no moderating effect was found.

In a further effort to investigate potential moderators, the total sample was divided into international and national alliances. Both subsamples show significant positive weighted average correlations ($\bar{r} = 0.144$ and $\bar{r} = 0.176$), but again the differences are not statistically significant. Although the subsample shows a smaller average residual variance as compared to the total sample, a moderating effect cannot be confirmed.

In a next step, partner size was investigated as a potential moderator. Value creation in alliances is significantly positive for the smaller partner ($\bar{r} = 0.353$) and the larger partner ($\bar{r} = 0.181$). The correlation for the smaller partner is remarkably large and is the highest weighted average correlation in this meta-analysis. Although the average residual variance of the two subgroups is larger than in the total sample, a significant difference between the

Table 3: Results of meta-analysis on value creation in alliances

K: number of correlations; N: total sample size ($\sum N$); $\bar{r}$: weighted average correlation; s_r^2: observed variance; s_e^2: sampling error variance; s_ρ^2: residual variance; ***/**/*: 0.01/0.05/0.1 level of significance; a: Joint ventures vs. Contractual alliances; b: Horizontal vs. Non-horizontal; c: Horizontal vs. Vertical; d: International vs. National; e: Larger partner vs. Smaller partner; f: Developed & emerging vs. Developed only; g: US & non-US vs. US & US; h: Marketing vs. Technological; i: Manufacturing vs. Service

Level	K	N	$\bar{r}$	s_r^2	s_e^2	s_ρ^2	s_e^2 / s_r^2	95% Credibility interval	95% Confidence Interval	Failsafe N	z
Total sample	**70**	**11,017**	**0.165**	**0.018**	**0.006**	**0.012**	**0.343**	**−0.046:0.375**	**0.134:0.196**	**15,083**	
Joint ventures	48	6,204	0.151	0.017	0.007	0.010	0.434	−0.041:0.344	0.114:0.188	4,983	-0.559[a]
Contractual alliances	10	2,820	0.179	0.021	0.003	0.018	0.157	−0.083:0.440	0.089:0.269	487	
Horizontal	11	776	0.274	0.013	0.012	0.001	0.966	0.233:0.314	0.209:0.339	315	-0.202[b]
Non-horizontal	9	593	0.257	0.054	0.013	0.041	0.244	−0.141:0.654	0.104:0.409	134	
Vertical	5	227	0.268	0.110	0.019	0.091	0.173	−0.323:0.859	−0.022:0.559	29	0.036[c]
International	29	2,960	0.144	0.016	0.009	0.007	0.586	−0.016:0.303	0.098:0.190	1,089	-0.778[d]
National	12	1,527	0.176	0.014	0.007	0.007	0.516	0.013:0.339	0.109:0.244	245	
Larger partner	9	455	0.181	0.024	0.019	0.005	0.760	0.031:0.331	0.131:0.231	47	-1.555[e]*
Smaller partner	8	408	0.353	0.076	0.015	0.061	0.198	−0.131:0.836	0.162:0.544	240	
Developed & emerging	6	308	0.072	0.062	0.019	0.043	0.313	−0.331:0.475	0.062:0.271	-	-0.737[f]
Developed only	14	1,805	0.150	0.015	0.007	0.008	0.511	−0.015:0.315	0.087:0.213	243	
US & non-US	7	479	0.113	0.041	0.014	0.027	0.350	0.113:0.113	−0.036:0.263	14	-0.679[g]
US & US	10	1,309	0.171	0.014	0.007	0.007	0.514	0.009:0.333	0.098:0.244	164	
Marketing	6	570	0.119	0.034	0.010	0.024	0.305	−0.180:0.418	−0.027:0.266	21	0.212[h]
Technological	8	527	0.099	0.031	0.015	0.016	0.480	−0.150:0.348	−0.023:0.221	26	
Manufacturing	4	1,427	0.257	0.007	0.002	0.005	0.341	0.123:0.392	0.175:0.340	200	0.98[i]
Service	9	726	0.207	0.008	0.011	0	>1	0.207:0.207	0.137:0.276	152	

average weighted correlations of the smaller and the larger partner as well as a significant *z*-score at the 10% level can be found; therefore size can be identified as a moderating variable influencing value creation in alliances. The subsample of the larger partner is furthermore homogeneous; the smaller partner therefore seems to obtain more benefits from an alliance than the larger partner.

To test hypothesis six, a differentiation between emerging market countries and developed countries was made. The highest value creation was found in alliances between partners from developed countries; although the differences between the two subgroups are relatively large, the conditions for being a moderator are not fulfilled, confirming hypothesis six. Upon testing for any differences between alliances formed by a US parent firm with another US partner and those formed with a non-US partner, no significant differences could not be found.

The results of the meta-analysis of the subsample of technological and marketing alliances show that the seventh hypothesis cannot be confirmed. Both types of alliances obviously lead to similar success. The *z*-score is insignificant and no moderating effect can be found; none of the subsamples are homogeneous.

In addition to the moderators that have been derived from the underlying theories, an investigation was also performed to determine whether there are differences in value creation according to the industry in which an alliance took place. The alliances in the sample have been classified in accordance with the International Standard Industrial Classification of All Economic Activities (ISIC Rev. 3.1), into alliances in the manufacturing sector[22] and alliances in the service sector[23]; the service sector mainly includes co-operative ventures in the real estate and rental business as well as investment services. The sample of alliances in the manufacturing sector is quite heterogeneous, ranging from alliances in the chemical industry to alliances in aerospace and defense, the semiconductor industry, biotech, the pharmaceutical sector, and many more. The value gains for alliances in the manufacturing sector ($\bar{r}$ = 0.257) were found to be higher than those for service sector alliances ($\bar{r}$ = 0.207). A smaller average residual variance in the subsamples than that in the total sample is also given. Furthermore, the population of alliances in the service industry is homogenous, but as the *z*-score is insignificant, the industry cannot be clearly identified as a moderator.

4.6 Discussion

The major research objectives were to answer the questions: 1) do alliances create value for their parent firms, and 2) which factors influence value creation in alliances? In light of the meta-analytic results obtained, the overwhelming conclusions, drawn from decades of alliance

[22] This corresponds to Code D in ISIC Rev. 3.1.

[23] The service sector subsample only includes firms that appear under the J and K Code in ISIC Rev. 3.1.; other service sector activities did not appear in the sample.

research, must be that alliance activity, on average, does lead to value creation for parent firms. The integration of 70 correlations from 40 studies reveals small significant positive value gains, as measured by the abnormal returns in the stock market; this result seems to confirm the theories discussed above, which predict value creation in alliance activities, and this suggests that the stock market expects that alliance activities will create longer-term synergies as partners benefit from the pooling of their resources or from the coordination of their activities.

Based on the results of the meta-analysis, hypothesis two could not be confirmed. Joint ventures as well as contractual alliances seem to have a similar impact on firm performance. This result supports the arguments that there also exist some sources of value creation, such as flexibility and cost advantages that are more likely to be available to contractual alliances; meanwhile, lower transaction costs might be achieved in joint ventures, whereas coordinated ventures probably benefit from lower agency costs.

No moderating impact based on alliance type (horizontal vs. non-horizontal) could be found. In non-horizontal—particularly heterogeneous—alliances, the partners involved presumably would look more closely at potential synergies; planning of a non-horizontal alliance would be more detailed, and the partners would probably invest more time in the entire transaction process. At the same time, managers habitually assume a high synergy potential per se in horizontal alliances, a potential that often remains illusory. Furthermore, there were no significant differences when comparing horizontal and vertical alliances; whereas horizontal alliances may be capable of achieving operational and collusive synergies, the combination of firms at different production stages in the same industry (vertical alliances) may achieve a more efficient coordination of the different levels, as bargaining costs can be avoided (Williamson, 1975).

Nor does it appear to matter whether an alliance is national or international. The advantage of international alliances is immediate access to a foreign market; a company may further exploit monopolistic advantages in a foreign country and can achieve international diversification benefits for its investors. At the same time, the foreign partner profits from the existing network and market knowledge of the local partner. But obviously, there are also many benefits in national alliances. The partners avoid problems related to cultural differences and are able to operate in the same legal and social environment; this brings its own cost savings.

Next, it has been found that the size of the firm does matter in the value creation process via alliance activities. The smaller partner in an alliance is much more successful than the larger partner and thus might be able to acquire much more business-related knowledge and gain access to other resources that would probably not otherwise be accessible. This finding is in line with other previous empirical studies investigating the impact of firm size on success (e.g., Merchant, 2005). The smaller partner probably will be able to earn relatively larger

excess returns (McConnell and Nantell, 1985) and is likely to have relatively greater bargaining power than the larger partner (Das et al., 1998).

As suggested by hypothesis six, for firms from a developed country it makes no difference to shareholder value creation whether a firm forms an alliance with a partner from an emerging market country or with a partner from a developed country. A potential explanation may be cultural differences and, as a consequence thereof, interaction difficulties and misunderstandings that may arise in alliances with partners from both developed and emerging market countries.[24] In the end, the choice of the nationality or the location of the partner will depend upon the tasks to be accomplished by the alliance and the particular characteristics required from the partner.

Furthermore, technological and marketing alliances obviously lead to similar success. In technological alliances the partner firms often benefit from sharing the high fixed costs of technological development as well as the contingency risk; conversely, firms engaging in marketing alliances may gain access to new markets and customer segments, and profit from the local market know-how, particularly in international alliances.

Although many previous empirical studies (e.g., Schmalensee, 1985 or Rumelt, 1991) have determined that the industry in which a firm is operating has a significant effect on firm performance, it could not be confirmed as a moderator in this meta-analysis. Differentiating by industry reveals that alliances in the manufacturing sector are more successful than alliances in the service sector, but the differences are not significant. Whereas alliances in the manufacturing sector may benefit from the pooling of production capacities and, as a consequence thereof, may be able to realize economies of scale and to decrease risk and capital needs, parent firms in the service sector probably profit from the joint use of distribution and sales facilities and thereby a greater geographic reach.

This meta-analysis is not without its limitations; in the interpretation of the results, one must be attentive to the limitations of such approaches. Meta-analyses relying on bi-variate relationships cannot demonstrate causality per se, but the event studies in the sample do explicitly consider the effect an alliance is expected to have on a firm's future performance. Prior studies, however, have also investigated whether firm performance may influence the formation of alliances. Mohanram and Nanda (1995) found that joint ventures tend to be announced when the parent firms' performance is deteriorating, but a later study with a much larger sample, by Chan et al. (1997), found that firms entering strategic alliances tend to have a record of superior operating performance relative to their industry peers, suggesting that the formation of an alliance is not a response to poor performance (Chan et al., 1997).

[24] Unfortunately it was not possible to compare alliances among partners from developed countries only with alliances among partners from emerging market countries only, as the latter were not present in the empirical literature in numbers sufficient for a meta-analysis.

Unfortunately, none of the included studies reported the necessary information for a correction of artifacts other than sampling error, so the results can only be interpreted as conservative estimates of the true relationship; moreover, a number of studies had to be omitted from the meta-analysis because they did not contain sufficient information for the computation of effect sizes. Finally, a more detailed reporting in the primary investigations would have allowed a further moderation of the sample; however many of the studies contained information which, unfortunately, could not be used due to a lack of detail in reporting. As already mentioned in previous meta-analyses on M&As (see Bausch and Fritz, 2005) a more complete reporting of research results in published articles is also needed for this topic. In the future, statistical tests should be included or—at a minimum—zero-order correlations should be reported (Eden, 2002). With more detailed reporting of research results, the ability to compare and draw conclusions can only lead to greater accuracy in the interpretation of empirical data.

4.7 Summary and conclusions

By employing meta-analytic techniques, it has been found that parent firms entering an alliance are able to realize small but significant value gains, but unfortunately, the conditions under which value creation occurs in alliances could not be determined. The moderation of the sample disclosed only one variable that influences the performance of alliances: the size of the partner firms. In addition, it was found that alliances in the manufacturing sector had higher value gains than alliances in the service sector but it was not possible to clearly identify the industry as a moderating variable, as the Z-score was insignificant. It was further found that the journal in which the primary studies were published has a moderating effect; this result might suggest a publication bias. Altogether, the results of the moderator analysis indicate that the performance of alliances as appraised by the stock market is influenced by variables unspecified in existing empirical research; hence changes to research models and methods may be needed.

Future research needs to identify the conditions under which alliances become a reasonable path to superior performance. The analysis was limited to those variables that consistently appear in primary investigations; further moderating variables may exist. Other potential moderators might be the number of involved partners, intangible assets, a firm’s position in inter-organizational networks, prior alliance experience, and control issues as well as business environment factors such as industry characteristics and political risks, to name but a few. Most of these variables have been examined in one or the other study, but unfortunately not in a sufficient number; this indicates that researchers are continually investigating new effects and only rarely building on past research models.

Furthermore, although there are notable exceptions (e.g., see Merchant and Schendel, 2000), most empirical studies base their explanations on only one of the many available theories and fail to integrate complementary explanations of shareholder value creation in alliance activities. Most explanations are based on transaction costs or synergy arguments derived from the M&A literature. Synergy as the core element in a research model may lead to high conceptual abstraction and thus may not be helpful in identifying the rather specific conditions under which value creation occurs in alliances (see also King et al., 2004). Future research should attempt to integrate different theoretical perspectives and also take into consideration more recent concepts such as network theory (Gulati, 1998a). Furthermore, the explanation of value creation in alliances may also require a more in-depth look at the concept of complementary resources; the joining or pooling together of the existing resources of the partner companies may lead to growth opportunities that are taken into account by the stock-market, as investors are more likely to be interested in firms with high growth prospects (Canals, 2000).

Future studies might also consider how various interactions between variables may influence value creation in alliances. The wide variance in the total sample suggests that certain subgroups have significant value gains in alliances. A better understanding of the interaction of different moderator variables may help to identify these subgroups.

The influence of nonlinear relationships between potential moderators and the performance effects of alliances could also be analyzed in future research and it would be advantageous if researchers further examined whether current firm performance has any impact on alliance formation intentions (see e.g., Lohrke et al., 2006).

To better understand the conditions for value creation in alliance activities, new methodological approaches may also be required. In this analysis the author chose to take the shareholders' perspective in evaluating firm performance by focusing on stock market event studies. There might be other relevant dimensions of firm performance; by using not only stock market returns as a measure of a firm's performance but also accounting data, future studies might possibly reveal other antecedents.

The meta-analytical results obtained also have important managerial implications. First, it can be said that, on average, value creation occurs in alliances for shareholders of the parent firms; furthermore, the results clearly indicate that the smaller partner is able to capture more benefits from the alliance than the larger partner. It was not possible to reveal other variables influencing value creation in alliances. This stresses the need for a thorough and comprehensive analysis of the situation by managers intending to enter a business alliance. They need to be aware that there is no simple recipe for successfully conducting co-operative ventures. Managers should be as clear as possible on how, why, and where an alliance can strengthen their firm and thus lead to value creation for shareholders.