Characteristics of strategic research alliances and firm valuation: A comparison of Asian and American firms

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Project Summary

Strategic Research Alliances are important arrangements in pooling resources and sharing complementary strengths by alliance partners for mutual benefit. They enable firms to concentrate scarce resources on their core skills and learn or acquire additional capabilities from suitable partners (Martin, 2003). Additionally, they help firms increase their geographic reach, improve technological capabilities, reduce risk, reduce product development costs and enable firms to reach market faster. Shareholders reward such alliances when they perceive potential for increased cash flows from such an alliance.

Drawing from Organizational Learning Theory and Resource Based Theory, this study will examine the stock market valuation of a research alliance based on firm level characteristics such as relative size of the firms involved, governance structures, alliance scope and partner type.

The unique feature of this study is that it uses multiple characteristics of a strategic research alliance. It is also probably the first study to examine valuation effect of a firm based on the type of partner. Since different partners bring in different skills and capabilities it may be interesting to see the perceptions of partner strengths by the stock market. This may be valuable knowledge to firms pursuing successful alliances. It uses longitudinal data on firms in the bio-technology industry and utilizes an event study methodology to estimate valuation consequences of the alliances.
**Introduction**

Strategic Research Alliances (SRAs) enable two or more firms to pursue joint research by pooling complementary resources and capabilities (Varadarajan & Cunningham, 1995). Such alliances not only help firms share resources and share risks (Kogut, 1988) but also act as a means of “rapid competitive repositioning” by reducing product development costs and times (Porter & Fuller, 1986). Many such alliances result in new product design and development, improved production methods, innovative marketing and distribution systems. According to a survey by Coopers and Lybrand more than half of the fastest growing companies in the US are involved in strategic alliances both within and across industries (WSJ, 1995 in Chan et al., 1997). These alliances range from cooperative arrangements to equity based formal agreements and the scope of alliances ranges from a joint product development to a joint process improvement.

The stock market has generally favored alliance activity among companies since they are viewed as improving a firm’s cash flows and reduce firm risk. The empirical evidence of benefits of an alliance has been mostly supportive. Several studies using event study methodologies have revealed that announcements regarding alliance formation have resulted in significant positive cumulative abnormal returns (CAR) for the firms involved (Das & Sengupta, 1998; Park & Kim, 1997; Mohanram & Nanda; Koh & Venkataraman, 1991 among others).

However the studies measuring stock market recognition of strategic research alliance activity have been narrow in scope. Most studies examined the influence of only one or two aspects of an alliance such as firm size (Chan et al., 1997), alliance purpose (Park, et al., 2004), firm profitability (Das et al., 1998), and alliance governance (Pangarkar & Klein, 2001). Additionally there have not been studies that examine the influence of partner characteristics on success of research alliance. Since each partner brings a unique capability and potential contribution to the alliance, partner selection is an important dimension determining the success of an alliance. Examples of partner types are firms, government, autonomous research laboratories and universities.

This study utilizes insights from Resource Based Theory and Organizational Learning Theory to examine the impact of firm level characteristics of strategic research alliances and their impact on stock market valuation.

**Review of Previous Research**

**Rationale for Alliance formation**

Majority of research in the area of strategic alliances draws from the resource based perspective (Wernerfelt, 1984; Peteraff, 1993) which views firms as bundles of tangible and intangible resources that can be exploited to earn above normal returns. A strategic alliance thus envisages firms to pool their complementary resources, share risk and costs in order to achieve synergistic benefits (Eisenhart & Schoonhoven, 1996).

Studies by Henderson & Cockburn, 1994; Varadarajan & Cunningham, 1995; Powell, et al., 1996 confirm this view.
Alliances and Firm Value
Compared to the performance implications of strategic alliances, the valuation implication of alliances seems to be an under-researched area. Of the few studies examining whether strategic alliances create value to the firm, the results have been mixed. Chan, et.al. (1997) report a positive abnormal return surrounding the announcement of an alliance, but the study by Das, et.al. (1998) find an overall insignificant reaction to such alliances. However, they did find a positive return with a subset of “technological” alliances. A study into the valuation effect of information technology alliances by Neill, et.al (2001) documented a positive abnormal return. This result has been confirmed by Park et.al., 2004 in a sample of e-commerce firms.

Firm Size
Firm size has also been found to have mixed effect on the value of the alliances. It is generally believed that investors perceived more profitable, larger firms as capturing less of the gain arising out of the alliances (Das, et.al., 1998 and Neill, et.al., 2001).

Alliance Scope
Technology alliances were found to be more beneficial in industries characterized by rapid technological changes, product complexity and high costs and risks associated with product development. Thus these alliances are more likely to receive more positive valuation from the stock market than other opportunistic alliances (Park et.al., 2004). At the same time Marketing alliances that lead to increased total market share, help promote product loyalty and new customer referrals were also viewed as being valuable to a company’s alliance future (Evans& Wurster, 1999). Additionally Pangarkar & Klein (2001) have shown that alliances where both partners share research activity are more likely to be viewed favorably than those where only one contributes the research activity.

Partner Type
Each partner is assumed to bring unique capabilities to an alliance. These capabilities could be a factor of the firm specific or proprietary knowledge, output of the collective knowledge of a university research team or the resources at the disposal of a government. Thus partner selection assumes a critical dimension in evaluating the benefits of an alliance.

Governance Mechanism
Since majority of the alliances suffer from an “inherent instability” arising from an uncertainty regarding partner behavior during the course of the alliance the mortality rates have been traditionally high. (Kogut, 1988;Blodgett, 1992). But these rates have been different based on the governance structure of the alliance. For example Pangarkar & Klein (2001) found that equity based formal agreements are more likely to succeed than non collaborative research agreements.

Therefore the primary research question this study intends to examine is as follows.

H1: The formation of strategic research alliance by firm results in an increase in firm value as reflected by positive abnormal stock returns around the time that the alliance is announced.
Additionally, the effects of each of the abovementioned independent firm specific variables will be studied based on literature review. For example,

**H2: Firm size is inversely related to positive abnormal return of the firm.**

**Research Methodology**

**Sample**
The sample for this study will be drawn from a list of strategic research alliances in the biotechnology sector. This is an industry which not only depends on strategic research alliances for its growth has witnessed a dramatic growth of such alliances in recent times. There are several commercially available databases that list strategic alliances in various industry sectors. For the purposes of the present study data is intended to be acquired from Recombinant Capital, a California based consulting firm specializing in biotechnology alliances. Their alliance database currently contains over 19000 high level summaries of biotech alliances since recorded 1973.

**Method**

Based on previous research in this area (Das et.al., 1998; Neill, et.al 2001 and Park et.al., 2004) this study utilizes an event study methodology which has been widely used in finance, accounting and marketing research literature to assess the value implications of the release of firm specific information. Alliance announcements compiled from Recombinant Capital bio-tech alliance data base are used as ‘events’ to test how the financial markets evaluate the effects of alliance activity on the uncertainty of a firm’s stock price level. This method assumes that in an efficient market the value of any new information will be reflected in appreciation in security prices.

**Dependent Variable**

The dependent variable in this study is change in firm value surrounding an alliance announcement. It is operationalized using cumulative abnormal returns (CARs) which are the sum of daily abnormal returns during a specified event window of day –3 to day +3 in order to allow for information leakage and slow market response to an announcement. The abnormal returns capture the percentage change in stock price after adjusting for a focal firm’s systematic risk and general stock market movements. To calculate the daily AR (abnormal return) we can extract the residuals from a market model that estimates the firms’ stock price returns. Center for Research on Security Prices (CRSP) provides data on historical equity data. The market model controls for both the overall stock market movement and the bio-tech sector index that may influence the general daily stock prices of firms in this sector.

Thus the return (Rit) for firm i on day t is defined as:

\[ R_{it} = \alpha_i + \beta_i R_{mt} + \gamma_i B_{St} + \epsilon_{it} \]
Where \( R_{it} \) is the raw return and \( R_{mt} \) value weighted return \( m \) on day \( t \), \( BS_{mt} \) is the daily return of the NASDAQ biotechnology sector index and \( \alpha_i, \beta_i \) and \( \gamma_i \) are firm specific parameters and \( \epsilon_{it} \) is a random error term. Daily abnormal returns (AR) will be calculated as follows.

\[
AR_{it} = R_{it} - (a_i + b_iR_{mt} + g_iBS_{mt})
\]

(source: Park et al., 2004)

Where \( AR_{it} \) is the daily abnormal returns for firm \( i \) on day \( t \), \( R_{mt} \) is the daily return of the market index on day \( t \), \( BS_{mt} \) is the daily return of the NASDAQ biotechnology sector index and \( a, b \) and \( g \) are firm specific parameter estimates.

**Independent Variables**

*Firm Size:* It is measured as logarithm of firm sales and will be computed from company information included in COMPUSTAT database.

*Alliance Scope:* It denotes the larger defined purpose of the alliance activity and is categorized as R&D only, R&D plus manufacturing, R&D plus marketing and R&D plus manufacturing and marketing.

*Partner Type:* This categorizes the alliances into firm-firm, firm-government and firm-university groupings. Partner nationality is another factor that will be studied under this category.

*Governance Mechanism:* This is a dummy variable where governance = 0 when the alliance is governed by equity participation and is =1 when governed on the basis of a non equity contract.

**Model**

A preliminary model explaining the relationships is as follows.

<table>
<thead>
<tr>
<th>Firm Level Characteristics of SRAs</th>
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<tbody>
<tr>
<td>Firm Size</td>
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<tr>
<td>Alliance Scope</td>
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<td>Partner Type</td>
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<tr>
<td>Governance Mechanism</td>
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Diagram:

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   Firm Valuation
    /         \       |
   |         Firm Size  |
   |                   /
   |                  Alliance Scope  |
   |                  /     |
   | Partner Type       |
   | Governance Mechanism   |
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References


