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Product alliances, alliance networks, and shareholder value: Evidence from the biopharmaceutical industry

Sudha Mani [a,*], Xueming Luo [b,1]

[a] Cotsakos College of Business, William Paterson University, 1600 Valley Road, Wayne, NJ 07470, USA
[b] Fox School of Business, Temple University, 1801 Liacouras Walk, Philadelphia, PA 19122, USA

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ABSTRACT

Despite sustained interest in product alliance activity, little is known regarding the effect of product alliances on shareholder value. Whereas proponents of alliances justify their formation by emphasizing access to relevant resources and know-how, critics highlight the risks inherent in alliance partner opportunism. To reconcile these opposing viewpoints, we develop and test a conceptual framework that predicts the impact of product alliance activity and the broader network it engenders on shareholder value: stock returns, systematic risk, and idiosyncratic risk. Our examination of 359 biopharmaceutical firms and their associated networks over a 20-year observation window shows that unanticipated product alliance activity is associated with not only lower idiosyncratic risk, but also with lower stock returns. Unanticipated network centrality of the focal firm and the unanticipated density of ties in its extended network significantly moderate the effects of product alliance activity. Our findings help to reconcile the divergent views on product alliance activity.

1. Introduction

Strategic alliances account for as much as one-third of firms' revenues and value, and are increasing by approximately 25% every year (Wilson & Tuttle, 2008). In particular, product alliances—defined as formalized, non-equity,[2] collaborative arrangements among firms that exchange, share, or co-develop products (Rindfleisch & Moorman, 2001)—are associated with improved firm profits (Luo, Rindfleisch, & Tse, 2007) and favorable innovation outcomes (Wuyts, Stremersch, & Dutta, 2004). A dominant stream of research based on the relational view highlights the benefits of alliances through access to alliance partners' resources, assets, capabilities, organizational processes, information, and knowledge (Dyer & Singh, 1998; Kalaignanam, Shankar, & Varadarajan, 2007).

In spite of this impressive array of benefits, failure rates for product alliances are high (Sivadas & Dwyer, 2000), as are the risks of partner opportunism and the attendant costs of coordination and monitoring (Park & Ungson, 2001). A review of prior research reveals less enthusiastic evaluations of product alliances. Specifically, agency theory-based arguments highlight information asymmetries, which arise when one firm has more or better information than the other about its motivation and ability to contribute to the alliance (Park & Ungson, 2001; Reuer & Ragozzino, 2006). Such information asymmetries increase the costs of product alliance activity and suggest a far more cautious approach to the phenomenon.

Table 1 provides an overview of empirical research that studies the effects of alliances on shareholder value. Prior research offers useful insights, but is limited by its exclusive focus on the relational viewpoint. Although the agency theory-informed downsides of product alliances are widely acknowledged, there has been no formal examination of this alternate view. As a result, a definitive conclusion as to whether product alliances actually help or harm continues to elude us. This lack of conclusiveness is likely attributable to two additional limitations of prior assessments of product alliances.

A second limitation of prior empirical research on product alliances lies in its incomplete consideration of shareholder value. Firms create value by increasing their stock returns or decreasing their stock risk. Whereas the former refers to cash-flow levels, the latter reflects volatility and vulnerability (Hamilton, 1994). As Kale et al. (2002, p. 747) note, "while alliances can create value, they are also fraught with risk." Furthermore, all else being equal, investors prefer less volatile stocks (Graham, Harvey, & Rajgopal, 2005). Higher stock risk indicates increased investment risk and greater cost of capital, which damages a firm's long-term valuation (Hamilton, 1994) and survival prospects (Grinblatt & Titman, 1998). Prior research has focused primarily on the effect of product alliance activity on stock returns, largely ignoring the impact on stock risk. This unbalanced approach hinders a complete understanding of the impact product alliance activity has on shareholder value.

* Corresponding author. Tel.: +1 973 720 3872; fax: +1 973 720 3854.
E-mail addresses: manis1@wpunj.edu (S. Mani), luoxm@temple.edu (X. Luo).
[1] Tel.: +1 215 204 4224.
[2] Equity ownership confers greater control of one firm over another (Kale, Dyer, & Singh, 2002), which alters the relational dynamics and poses varying implications for firm outcomes. An examination of such equity relationships is beyond the scope of this study.

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Table 1
Research overview—product alliances, networks, and shareholder value.

Study	Sample	Relational versus agency-theoretic view	Assesses the effect of product alliance activity on stock returns?	Assesses the effect of product alliance activity on stock risks?	Considered network effects on stock returns and stock risks?
Boyd and Spekman (2008)	73 product alliances for pharmaceutical, electronic equipment manufacturing, and software development	Relational	Yes	No	No
Das, Sen, and Sengupta (1998)	119 (49 R&D and 70 marketing) alliances in 18 industries	Relational	Yes	Yes (on total risk)	No
Kalaignanam et al. (2007)	167 product alliances in the computer and office equipment, prepackaged software, and communication equipment industries	Relational	Yes	No	No
Park and Mezias (2005)	408 alliances in the e-commerce industry	Relational	Yes	No	No
Park, Mezias, and Song (2004)	272 alliances (technology and marketing alliances) in the e-commerce industry	Relational	Yes	No	No
Swaminathan and Moorman (2009)	230 marketing alliances in the computer software industry	Relational	Yes	No	Yes (on stock returns)
This research	2394 firm-year observations, 359 firms, and 1381 product alliances in the biopharmaceutical industry	Relational and agency-theoretic	Yes	Yes (systematic and idiosyncratic risks)	Yes

A third key limitation of prior inquiries pertains to the scope of the firms' alliance activity. In addition to direct ties, firms are embedded within larger networks of ties, "complex, multifaceted organization structures that result from multiple strategic alliances" (Webster, 1992, p. 8). These embedded companies enjoy significant market (Achrol & Kotler, 1999) and informational (Powell, Koput, & Smith-Doerr, 1996) advantages, including improved firm innovation (Ahuja, 2000) and higher returns (Swaminathan & Moorman, 2009). Networks enable firms to learn about emerging opportunities, lower alliance partner search costs, and alleviate the risks of partner opportunism. Yet, as displayed in Table 1, their impact on firms' risk-return calculus remains largely unassessed.

The current research seeks to address these deficits, and provide a comprehensive assessment of the impact of product alliance activity (i.e., the degree to which firms engage in product alliances) and the networks they engender on stock returns and stock risks (systematic and idiosyncratic). We also examine the direct and moderating role of the firm's position (network centrality) and the structure of its embedded relations (network density). Relying on a unique database that we construct from three archival sources, we undertake a rigorous examination of 359 biopharmaceutical firms, as well as the 1381 product alliances in which they engage over a two-decade observation window and the associated networks that resulted.

We add to the growing body of knowledge about interfirm relationships and shareholder value in three key ways. First, acknowledging the conflicting perspectives of the *relational view* and *agency theory*, we develop alternate hypotheses for the effects of product alliance activity. By examining these divergent viewpoints, we acknowledge the possibility that both perspectives may be equally valid, depending on firms' relative prioritization of increasing stock returns or decreasing stock risk. In doing so, we provide a nuanced understanding of product alliance activity.

Second, we contribute to a better understanding of the effect of product alliance activities on not only stock returns, but also systematic and idiosyncratic risk. Firms that evaluate business performance with a single-minded focus on stock returns, regardless of their volatility, are more likely to invest in risky business opportunities (Markowitz, 1952). Thus, it is important to assess the impact of product alliance activity using CEO-relevant metrics—that is, stock returns *and* stock risks (systematic and idiosyncratic).

Third, we extend work that focuses on dyadic relationships, recognizing that firms are embedded in a larger web of connections. We build on the information-sharing view widely acknowledged in prior work, which suggests that firms benefit from the free flow of information in their network. In doing so, we acknowledge the role of indirect ties in improving shareholder value. To the best of our knowledge, this study is the first to examine the effect of product alliance activities *and* network characteristics on firms' stock return *and* on stock risk. Our examination of the direct and indirect ties pursuant to product alliance activity and their impact on objective measures of firm performance helps to minimize survey data-related concerns (Rindfleisch, Malter, Ganesan, & Moorman, 2008). We are thus able to assess the costs *and* benefits attendant to interfirm relationships.

In Sections 2 and 3, we describe our conceptual background and develop our hypotheses. Section 4 provides details on the research context, data collection, and analysis approach, while Section 5 presents the results of our examination. In Section 6, we discuss the implications of this research for academics and practicing managers, acknowledge its limitations and describe future research directions.

2. Conceptual background

2.1. Shareholder value

A comprehensive assessment of shareholder value must consider stock returns and stock risks. Whereas stock returns represent the level of future cash flows of the firm, stock risks entail *systematic risk* and *idiosyncratic risk* (Markowitz, 1952; Srinivasan & Hanssens, 2009). Systematic or market risk is the "extent to which the stock's return changes when the overall market changes" (McAlister, Srinivasan, & Kim, 2007, p. 35), measured by the stock's sensitivity to changes in the market. This market-driven risk reacts to changes in broad financial news (e.g., unemployment or inflation reports), so it is common to all stocks and cannot be diversified away (Lubatkin & Chatterjee, 1994). By contrast idiosyncratic risk is firm-specific and within managers' sphere of control and also comprises a significant component of average stock variance (Goyal & Santa-Clara, 2003).

2.2. Product alliance activities and network characteristics

The complexity, cost, and expertise needed to develop innovative products may lie beyond an individual firm's capabilities (Wind & Mahajan, 1997), and for this reason, firms engage in product alliances through direct ties in order to access external resources. Prior research