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Exploring Correlates of Product Launch in Collaborative Ventures: An Empirical Investigation of Pharmaceutical Alliances

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This paper examines collaborative ventures leading toward the launch of new products in the pharmaceutical industry. These collaborative ventures are one of the most underresearched areas in the new product literature, yet the preponderance of these collaborative ventures makes it an area of great importance for scholars and practitioners alike. As such, the purpose of the study is to examine why some collaborative projects produce a favorable outcome (the launch of a product) whereas others do not. That is, what characteristics of partner firms in the collaborative ventures and what characteristics of the partnership lead to a successful launch of a new product in the pharmaceutical industry? Secondary data from the pharmaceutical industry are employed in a multinomial logit model. Data from 128 collaborative ventures from 1980 to 2004 are used in the analysis. The partner firms in the collaborative ventures are from various industries ranging from malt beverages to pharmaceutical preparations to electronic and other equipment among others. Of the 128 collaborative ventures, 66 were successful in leading to a new product launch, whereas 62 did not result in the launch of a new product. The results from the multinomial logit analysis suggest that combined marketing resources of parent companies, combined technological intensity of parent companies, and combined asset bases of parent companies contribute to the likelihood of an eventual product launch in a collaborative venture. However, the results of the analysis show that contrary to expectations, technological complementarity of partners in the collaborative venture is not a significant predictor of successful new product launch. The results of the study suggest certain aspects for managers to consider when establishing collaborative ventures. To maximize the possibilities of the collaborative venture leading to the successful launching of a new product, managers should be concerned with the resources potentially available to partners in the collaborative venture from parent firms. These resources are not only of a financial but also of a technological nature. The existence of these resources does not ensure provision of resources to the collaborative venture; however, without the possibility of these resources it appears that successful launch of a product is less likely.

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Introduction

The evolution of firms from hierarchical structures to network forms (Achrol and Kotler, 1999) that is shaping the contemporary business environment has propelled renewed willingness among firms to collaborate with partners. Interfirm partnerships now encompass all aspects of value-chain activities, including new product development (Rindfleisch and Moorman, 2001). A flurry of collaborative new product ventures has been initiated, especially when the stakes are high, projects are costly, and the prerequisite technology is no longer in the domain of a single firm. To cite examples from one

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company, Philips has teamed up with Unilever to develop an electronic iron with an antigrease cartridge developed from Robijn detergent, with Inbev SA to develop a home beer appliance, and with the Sara Lee Corporation to develop Senseo coffee machines.

Although there is a vast extant literature on interfirm relationships in general (e.g., Anderson and Narus, 1990; Dwyer, Schurr, and Oh, 1987; Lusch and Brown, 1996), there have been fewer studies of collaborative ventures in new product development. This is somewhat surprising bearing in mind the growth of research and development (R&D) partnerships over the past three decades (Hagedoorn, 2002). Key contributions in the area of new product alliances include Faem, Van Looy, and Debackere (2005), Rindfleisch and Moorman (2001), Sivadas and Dwyer (2000), and Kotabe and Swan (1995).

The present investigation explores a fundamental aspect of new product alliances, that is, whether the collaboration results in a new product launch or termination of the alliance. While the launch of a new product is not necessarily conclusive evidence for the ultimate success of the collaboration, new product launch is a necessary step toward collaborative venture success. The collaboration may be considered a failure if it has not led to a product launch and has resulted in the termination of the collaborative venture. Thus, new product launch is a fundamental phenomenon of interest to marketing scholars. Empirical studies, especially in the context of specific industries such as pharmaceuticals, are essential to delineate correlates of new product launch versus termination of the project without any launch.

BIOGRAPHICAL SKETCHES

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The present investigation is intended to advance understanding of new product launch resulting from interfirm collaborations in two major directions. First, the researchers explore why certain collaborative ventures in new products produce favorable outcomes; specifically, collaborative projects that produce a favorable outcome (i.e., new product launch) are examined. Second, the firm- and alliance-specific factors that account for new product launch are examined through the analysis of a comprehensive database of new product alliances in the pharmaceutical industry.

The remainder of this paper is organized as follows. First, a conceptual framework for the study is provided. Key constructs and hypotheses are introduced. Then the research procedure is outlined, and the descriptive statistics for the sample of alliances—alliances that both culminate in a new product launch as well as those that ended without a launch—are presented. This demonstrates the profiles of firms involved in alliances that lead to launch and the profile of those that do not lead to launch. Results of the empirical analysis and a discussion are provided next. In conclusion, some managerial implications and recommendations for future research are presented.

Conceptual Framework and Hypothesis Development

The proposed conceptual framework draws from the resource-based view (RBV) of the firm. The RBV's conception of the firm as a collection of resources and capabilities gained widespread acceptance with a multitude of writings beginning in the 1980s (e.g., Barney, 1989, 1991; Connor, 1991; Ghemawat, 1991; Nelson and Winter, 1982; Peteraf, 1993; Rumelt, 1984; Teece, 1982; Wernerfelt, 1984). These scholars advanced the argument that the type, magnitude, and nature of a firm's resources and capabilities are critical to its profitability. Additionally, resources that are *valuable* and *rare* may provide a firm with a competitive advantage and, should those same resources be *inimitable* and *nonsubstitutable,* then they may provide sustained competitive advantage for the firm (Barney, 1991).

Traditionally, the resource-based view has considered the firm as the unit of analysis. However, the RBV can be extended to the interfirm alliance, or the collaborative venture, as the unit of analysis (Griffith and Harvey, 2001). Extending the logic of the RBV,

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the key determinants of new product alliance success include those resources partner firms can make available to the collaboration. These include tangible resources such as plant and equipment and intangible resources such as technology and know-how (Child and Yan, 2003). Das and Teng (2000) contend that members of an alliance can bring together dissimilar resources leading to complementary resource alignment, which may then have a positive effect on the collective strength of the alliance. It is plausible that, when engaged in an alliance, partner firms can acquire net new resources that are of greater value than the resources that existed to each firm prior to the alliance formation. Additionally, relationships stemming from new product alliance are considered to be an intangible resource (Sawhney and Zabin, 2002) and thus help to predict the success of new product alliance. Madhok and Tallman (1998) view relationships stemming from interfirm collaborations as a specialized resource that can potentially generate superior value.

The present research focuses on resources made available by the partnering firms to the alliance such as marketing expenditures, technological expertise, and combined assets of the partners in the new product alliance. In addition, the study also focuses on a relational resource, resource complementarity.

Marketing Resources

Both partners in a new product alliance may bring valuable marketing resources, including advertising prowess and sales force. The combined marketing resources of the partners should be a significant source of project success. New product ventures require active involvement of marketing expertise and resources. Previous research suggests that the existence of superior skills in marketing research is related to successful new product launch (Di Benedetto, 1999; Langerak, Hultnik, and Roben, 2004). Pursuing a market orientation (Jaworski and Kohli, 1993; Narver and Slater, 1990) helps alliance partners understand what their potential customers expected from the product and, as such, should provide information that will aid toward launch. In addition, a strong commitment to marketing will ensure that the alliance is able to manage its relationships with key stakeholders (Sawhney and Zabin, 2002), thus making a successful product launch more likely. Therefore, the combined marketing resources of the partners available to the new product alliance will be critical for success. More formally stated,

> *H1: The greater the combined marketing resources of the product alliance partners, the greater the likelihood of a new product launch as a result of the collaboration.*

Technological Intensity

Drawing on the extant literature, technological intensity refers to the extent of scientific know-how embedded in a firm (Guillen, 2003; Hennart, 1991; Hennart and Park, 1994; Ramaswamy, 2001). Success in the pharmaceutical industry is directly related to the technological prowess of the firms. Of all industries, pharmaceutical companies expend the greatest proportion of their sales revenue on research and development, typically averaging around 18% (Scherer, 2004). Therefore, the combined technological capabilities of the alliance partners should greatly facilitate new product launch. Such expertise is crucial in taking a new compound through multiple and complex processes of, for example, experimentation, testing, retesting, and validating (Cooper, 1996; Schmidt and Calantone, 2002). Previous studies indicate the necessity of technological proficiency for successful new product launch (Cooper and Kleinschmidt, 1987; Di Benedetto, 1999). Therefore,

> *H2: The greater the combined technological intensity of the alliance partners, the greater is the likelihood of a new product launch as a result of the collaboration.*

Asset Base

Companies in the pharmaceutical industry make substantial investments in the research and development of new products, and these costs are constantly rising. For example, in the pharmaceutical sector, the average cost of taking a new drug through the entire new product development process, including launch, is about $802 million (Smeal, 2002). Although the pharmaceutical industry may be an extreme case, other high-technology sectors (e.g., the semiconductor industry) experience similar cost structures associated with new product launch. Clearly, not all firms possess or have access to the financial resources required to be able to successfully proceed through all stages of the new product development process. If the partner firms lack access to sufficient financial resources, then

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it is likely that a new product development project will not come to fruition in terms of a successful launch. This is not to say that the firm must make use of all these assets available. However, the availability of these resources allows the alliance to proceed with the knowledge that the resources are available if required. If partners have sufficient resources at their disposal then there is a higher probability of successful launch. Therefore,

H3: The greater the combined asset base of partner firms in the new product alliance, the greater the likelihood of a new product launch as a result of the collaboration.

Technological Complementarity

A key reason why a firm may enter into an alliance is to supplement its technological resource base with those of its partners. In a collaborative venture, partners gain access to valuable skills and technologies previously unavailable (Mohr and Spekman, 1994). It is only through the integration of complementary skills that the partners may be able to take advantage of business opportunities that may arise. Two firms with a complementary technological resource base collaborating through an alliance should be able to enhance their chances to compete effectively in the marketplace. The alliances formed around partners with complementary resources are likely to be more successful (Hill and Hellriegel, 1994) and to generate greater rents (Dyer and Singh, 1998). In the context of new product development, arguments have been made that when firms combine complementary skills greater innovation results (Glaister, 1996). Therefore, in a new product alliance, the existence of technological complementarity through careful choice of partners is a resource in itself, and one that can lead to sustained competitive advantage. More formally stated,

H4: The greater the technological complementarity of the alliance partners, the greater the likelihood of a new product launch as a consequence of the collaboration.

Research Design

Sample

In this empirical study, new product launch and project termination are treated as the two potential outcomes in a collaborative venture involving product development. Focusing on a single industry such as pharmaceuticals is expected to nullify the industry effects and should provide for a more precise observation of the variables of interest. In addition, the pharmaceutical industry provides an ideal context for exploring launch versus termination issues. First, the industry is characterized by rapid change and intense competition with excessive variation in product specifications and market positioning across time. Second, new product launch comes as a result of a lengthy, costly, and arduous process in this industry. Advancement in the understanding of the characteristics that lead to launch rather than project termination would be of immense interest to practitioners in this industry. Third, collaborative ventures are abundant in this industry, and they provide the researcher with the opportunity to explore the relationships of interest in a definitive manner.

Data for the analysis are derived from two credible, proprietary sources. The first is the *Recap Database* of the Recombinant Capital Company. This database contains almost 20,000 accounts of pharmaceutical alliances initiated since 1973 and tracks the progression of 1,619 clinical trials since 1980 in which a pharmaceutical company is involved in compound development or commercialization. The second source consulted for this study is the *COMPUSTAT* database, which provides financial information about the pharmaceutical firms included in the *Recap Database*.

All collaborative ventures between two companies, for which the initiation date and termination date (where appropriate) is known, are included in the present study. A search of the *Recap* database for alliances satisfying this criterion yielded 315 product alliances. Those projects for which no financial data were available in *COMPUSTAT* were excluded, resulting in a final sample of 128 alliances. This final sample of 128 observations spans the years from 1980 to 2005. Descriptive statistics showing the number of new product alliances initiated each year, the number of those new product alliances leading to the launch of a product, and those where the collaboration was terminated are provided in Table 1.

The panel database utilized for this study offers various advantages over conventional cross-sectional or time-series data included in other studies focusing on similar phenomena (Hsiao, 1985, 2000). In addition to providing the researcher with an adequate number of data points, panel data studies offer larger

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Table 1. New Product Alliances Included in the Sample

Year	New Product Alliances Initiated	Launched Products	Terminated Alliances
1980	1	0	0
1981	3	0	0
1982	1	1	0
1983	1	0	0
1984	2	0	0
1985	6	1	0
1986	10	2	0
1987	4	1	0
1988	4	0	1
1989	6	1	0
1990	7	0	0
1991	12	4	2
1992	9	3	4
1993	10	1	11
1994	9	7	0
1995	9	6	6
1996	5	4	8
1997	13	6	5
1998	6	9	3
1999	5	4	6
2000	3	1	7
2001	1	3	5
2002	0	4	1
2003	0	5	1
2004	1	2	1
2005	0	1	1
Total	128	66	62

degrees of freedom and less collinearity among the independent variables, improving the efficiency of estimates. Longitudinal data also provide the researcher with the ability to analyze several effects of duration that cannot be addressed using either cross-sectional or time-series data (Hsiao, 2003). For instance, the variance dynamics of change in a given industry cannot be observed and, hence, cannot be explained using cross-sectional data. Finally, panel data may generate more accurate predictions for individual outcomes than time-series data alone. As Hsiao (2003, p. xx) suggests, "Panel data provides the possibility of learning an individual's behavior by observing the behavior of others."

Dependent Variable: Project Outcome

The dependent variable in the analysis is project outcome—a dichotomous variable equal to 1 if the alliance results in new product launch at some point during the new product collaboration and 0 if the alliance is terminated at any stage, without any product launch.

Independent Variables

Marketing Resources of Alliance Partners. Following previous studies (e.g., Bharadwaj, 2000; Dutta, Narasimhan, and Surendra, 1999, 2005; Hand, 2004; Lev and Radhakrishnan, 2005; Mittal et al., 2005; Roberts, 1999; Wuyts, Dutta, and Stremersch, 2004), total annual selling and general administrative expenses (SGA) of the partners expressed as a percentage of total annual sales is used as a proxy for the joint marketing resources of the firm. Firms in the pharmaceutical industry rely heavily on extensive sales forces, and this proxy variable captures this. SGA includes direct expenses such as credit, warranty, and advertising and indirect expenses such as telephone, interest, and postal charges.

Technological Intensity. As in previous research (Caves and Mehra, 1986; Guillen, 2003; Hennart, 1991; Hennart and Park, 1994; Ramaswamy, 2001), technological intensity is operationalized as total annual R&D expenditures of the partners, expressed as a percentage of their total sales for that year. This measure has been found to be relevant for a firm's success in new product projects (Cooper and Kleinschmidt, 1994; Ettlie, 1998; Song and Parry, 1994).

Asset Base. The pharmaceutical industry is conspicuous by the substantial resources that need to be committed for successful innovation. As a potential correlate of new product launch in collaborations, the natural logarithm of the total combined assets for the partners is utilized. The data are derived from *COMPUSTAT*. The natural logarithm of a firm's total assets has been widely used as a proxy for firm size (Barber, Heath, and Odean, 2003; Bayus, Erickson, and Jacobson, 2003; Caves and Mehra, 1986; Guillen, 2003; Knott, Bryce, and Posen, 2003; Kotabe, Srinivasan, and Aulakh, 2002; Merchant and Schendel, 2000; Reuer, 2001). Therefore, the sum of natural logarithms of the assets for the firms forming the alliance is an intuitive proxy for the size of the alliance.

Technological Complementarity. The pharmaceutical industry is composed of firms with a wide variety of technological and therapeutic specializations. Therefore, no two firms are alike in terms of their product and technological capabilities. The technological complementarity of the partners is defined by the dissimilarity of the four-digit standard industrial classification (SIC) codes (Imel and Helmberger,

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1971; Lecraw, 1983; Park and Ungson, 1997; Richards and De Carolis, 2003), such that those firms with different SIC codes are considered to have technological complementarity. Technological complementarity is operationalized using two dummy variables. Specifically, both of these dummy variables are coded as 0, indicating no complementarity, if the four-digit SIC codes of the partners are the same. The two dummy variables are coded as 1 and 0, respectively, when the two-digit SIC codes of the partners are different (i.e., if the partners are from different major industry groups). Alternatively, they are coded 0 and 1, respectively, when the partners have the same two-digit SIC codes but their four-digit SIC codes are different (i.e., partners are from different divisions of the same major industry group).

Analysis Model

The analysis model examines the effect of interactions of various characteristics of collaborating firms on the probability of new product launch. To alleviate the threat of multicollinearity, mean centering as suggested by Cronbach (1987) and used in many studies (e.g., Kohli and Jaworski, 1994; Singh, 1998; Swan et al., 2005; Yi, 1989) was employed. Multinomial logit (MLOGIT) was used to test the hypothesized relationships. Developed from a theory of probabilistic choice in economics (McFadden, 1974), MLOGIT is a frequently utilized statistical technique. It lends itself to the analysis of choices and can also test the significance of independent variables leading to the choice (Chang and Rosenzweig, 2001). This technique estimates the impact of the selected independent variables on the probability of success associated with product alliances. The MLOGIT was modeled in line with Chang and Rosenzweig using the maximum likelihood function in STATA 8.0.

Empirical Findings

Profiles of the Partner Firms in the New Product Alliances

The profiles of those firms involved in the new product alliances leading to product launch and those failing to lead to product launch are provided for each individual firm in Table 2. In addition, the corresponding SIC codes for each individual firm are presented in Table 3.

Table 2. Profile of the Partnering Firms in the Collaborative Ventures[a]

	Product Launch		No Launch	
	Mean	Standard Deviation	Mean	Standard Deviation
Asset Base	6.52	2.21	6.03	2.01
Marketing Resources	0.18	0.11	0.21	0.16
Technological Intensity	0.21	0.19	0.21	0.20
N	132		124	

[a] Asset base in US$ millions; marketing resources are expressed as a percentage (i.e., the percentage of company's sales revenue allocated to advertising); technological intensity is expressed as a percentage (i.e., the percentage of company's sales revenue allocated to R&D activities).

The sample contains 66 new product alliances that led to the launch of a product and 62 new product alliances that were terminated without product launch. In our database, 132 firms from 10 different industry categories took part in 66 new product alliances that led to a launched product. The largest representation of firms is from the pharmaceutical preparations industry with 60 firms. In addition, the sample also includes 44 firms from the biological products industry and another 12 firms from the plastic

Table 3. Standard Industrial Classification Codes

SIC Code	Industry	Product Launch	No Launch	Total
2082	Plastics Materials and Synthetic Resins	12	1	13
2800	Malt Beverages	0	5	5
2821	Chemicals and Petroleum Products	2	0	2
2834	Pharmaceutical Preparations	60	66	126
2835	In Vitro/In Vivo Diagnostic Substances	6	11	17
2836	Biological Products-Ex Diagnostic	44	35	79
3561	Pumps and Pumping Equipment	1	0	1
3600	Electronic and Other Electrical Equipment	2	2	4
3674	Semiconductors and Related Devices	1	0	1
3841	Surgical Medical Instruments/ Apparatus	2	2	4
3842	Orthopedic and Prosthetic Appliances	2	0	2
7370	Computer Programming and Consulting Services	0	2	2
Total		132	124	256

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materials and synthetic resins industry. Of the individual firms involved in alliances that led to a product launch, the mean asset base is \$6.52 billion, with 3% of sales revenue allocated to advertising and 21% of sales revenue allocated to research and development activities.

In the 62 new product alliances that were terminated without product launch, there were 124 firms from eight different industry classifications. As with the alliances that led to product launch, the largest grouping of firms came from the pharmaceutical industry with 66 firms. Some 35 firms were from the biological products industry, and 5 were from the malt beverages industry. The mean asset base of these firms is \$6.03 million, with 3% of sales revenue allocated to SGA and 21% of sales revenue allocated to research and development activities.

Multinomial Logit Analysis

An examination of the correlation matrix, reported in Table 4, suggests that multicollinearity does not appear to be a problem. The multinomial logit models described earlier are estimated by clustering the standard deviations for each alliance. The results of the alternate specifications for two alternate endings (i.e., terminated vs. successfully completed new product projects) of each alliance-year unit are presented in Table 5. The model has a satisfactory fit to the data, with a Wald chi-square statistic of 71.91 significant at the 0.001 level. The pseudo R^2 of the full specification is 0.132. Also, the stability of the coefficients across alternate specifications in terms of magnitude and significance indicates that results are relatively robust and that multicollinearity is not a concern.

H1 posited that greater combined marketing resources of the product alliance partners would positively impact on the likelihood of the new product alliance leading to the launch of the product. This hypothesis is fully supported by the findings. The interaction of marketing resources has a significant positive impact on launch of the product ($\beta = 2.273$, $z = 2.83$, $p < .01$), providing strong support for H1. Additionally, the combined marketing resources of the partners shows no significant impact on the probability of a failure to reach product launch ($\beta = -0.473$, $z = -0.31$, $p > .1$).

The results also support H2. The combined technological intensity of partners (as demonstrated by the interaction) in an alliance has a significant positive impact on the probability of success of the project ($\beta = 2.425$, $z = 2.31$, $p < .05$). Additionally, the combined technological intensity of the partners shows no significant impact on the probability of a failure to reach product launch ($\beta = 0.842$, $z = 0.40$, $p > .1$).

H3 is also supported. This hypothesis states that the greater the interaction of the asset bases of the

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		Variable	Mean	Standard Deviation	1	2	3	4	5	6	7	8	9	10	11
1		Project Outcome	0.270	0.619	1										
2	Firm 1	Asset base	5.195	1.772	**0.117**	1									
3		Marketing Resources	7.123	40.308	–0.035	**0.196**	1								
4		Technological Intensity	4.459	25.762	0.033	**–0.368**	**0.527**	1							
5	Firm 2	Asset base	8.527	1.790	0.057	**0.207**	0.014	–0.052	1						
6		Marketing Resources	0.724	1.418	–0.067	–0.032	0.046	0.044	**0.146**	1					
7		Technological Intensity	0.314	0.997	0.010	–0.054	0.015	0.057	**–0.650**	**0.025**	1				
8		Tech. Complementarity 1	0.250	0.433	–0.003	**0.178**	–0.064	–0.065	0.037	**–0.129**	**–0.134**	1			
9		Tech. Complementarity 2	0.480	0.500	–0.024	**–0.124**	0.023	0.022	0.054	0.031	0.029	**–0.521**	1		
10	Interactions	Asset base	46.142	19.613	**0.155**	**0.692**	**–0.179**	**–0.177**	**0.614**	**–0.233**	**–0.228**	**0.189**	**–0.120**	1	
11		Marketing Resources	3.612	12.315	–0.033	**–0.251**	**0.637**	**0.637**	**–0.173**	**0.207**	**0.204**	**–0.116**	–0.011	**–0.276**	1
12		Technological Intensity	0.875	3.385	–0.022	**–0.209**	**0.534**	**0.534**	**–0.287**	**0.316**	**0.315**	**–0.121**	–0.029	**–0.282**	**0.687**

* Values in bold fonts indicate $p < 0.05$

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Table 5. Estimated Multinomial Logit Coefficients by Outcome of Collaborative Venture

	Specifications			
Covariates	Coefficient	Robust Std. Err.	z	P>|z|
Collaborations Failing to Result in Product Launch				
Firm 1				
Asset Base	0.030	0.108	0.28	0.779
Marketing Resources	0.554	0.689	0.80	0.422
Technological Intensity	−0.869	1.078	−0.81	0.420
Firm 2				
Asset Base	**−0.381**	**0.174**	**−2.18**	**0.029**
Marketing Resources	−0.473	1.512	−0.31	0.754
Technological Intensity	0.842	2.128	0.40	0.692
Interactions				
Asset Bases	0.030	0.108	0.28	0.779
Marketing Resources	−0.473	1.512	−0.31	0.754
Technological Intensity	0.842	2.128	0.40	0.692
Technological Complementarity 1	−0.586	0.519	−1.13	0.259
Technological Complementarity 2	0.558	0.336	1.66	0.097
Collaborations Resulting in Product Launch				
Firm 1				
Asset Base	**0.283**	**0.084**	**3.38**	**0.001**
Marketing Resources	0.846	0.755	1.12	0.263
Technological Intensity	−1.323	1.181	−1.12	0.263
Firm 2				
Asset Base	−0.059	0.117	−0.50	0.617
Marketing Resources	**1.870**	**0.910**	**2.06**	**0.040**
Technological Intensity	**2.092**	**1.116**	**2.09**	**0.037**
Interactions				
Asset Bases	**0.283**	**0.084**	**3.38**	**0.001**
Marketing Resources	**2.273**	**0.802**	**2.83**	**0.005**
Technological Intensity	**2.425**	**1.051**	**2.31**	**0.021**
Technological Complementarity 1	−0.114	0.158	−0.72	0.472
Technological Complementarity 2	**−0.479**	**0.171**	**−2.80**	**0.005**

partner firms, the greater the likelihood of a new product launch. The interaction of the asset bases is positively related to the likelihood of success ($\beta = 0.283$, $z = 3.38$, $p < .01$).

H4 states that collaborative ventures consisting of firms whose technologies complement one another would be more likely to see their alliance result in a launched product. Findings fail to provide support for this hypothesis. Specifically, no significant impact of technological complementarity on product launch was found when the partners were from different major industry groupings ($\beta = -0.114$, $z = -0.72$, $p > .1$), and a significant negative impact on product launch was found when the partners were from the same major industry group but different at the four-digit SIC level ($\beta = -0.479$, $z = -2.80$, $p < .01$).

Discussion

Interfirm collaborations are growing in popularity, and alliances formed between partners for the specific purpose of developing new products are no exception. Unfortunately, there is still a paucity of studies examining the consequences of new product alliances. In an alliance, many advantages accrue to collaborating firms, including the ability to exploit new markets (Littler, Leverick, and Bruce, 1995), shared risks (Perks, 2000), and gaining access to new technologies otherwise unavailable (Mohr and Spekman, 1994). All told, the benefits are such that collaborative ventures involving joint product development are likely only to grow in the future. The present investigation provides some preliminary insights into the determinants of success in such ventures, defined in terms of whether the collaboration results in a product launch. The study context is the pharmaceutical industry where collaboration is the norm and the fruits of such collaboration are critical to partner firms.

The empirical results suggest that combined marketing resources (H1) have a positive impact on the likelihood of a successful product launch resulting from a new product alliance. This finding bodes well for marketers in the current corporate environment where being accountable and demonstrating positive returns from every investment have become imperative. Both scholars and practitioners have urged marketers to be more cognizant of the need to measure returns from marketing investment (Moorman and Rust, 1999). The results of the present study demonstrate a potentially positive impact of marketing resources originating from the collaborating partners on the likelihood of launching a new product. This is in harmony with the contention that adequate marketing commitments at various stages of the new product development process should enhance the likelihood of success (Im and Workman, 2004). Findings provide clear evidence that those new product collaborations with substantial marketing resources available to them are more likely to reach the launch stage.

Greater combined technological intensity (H2) is also shown to positively impact the likelihood of new product launch. The actual amount of research and development capabilities available to partnering firms will influence the ability of the firms to move successfully toward launch. The initial development and testing of the product throughout the stages are both costly (Schmidt and Calantone, 2002) and technologically intensive. Partnering firms with adequate

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technological resources at their disposal should be more successful in getting their products to market launch.

The empirical results also provide support for H3, the contention that the greater the combined asset base of the partnering firms, the greater the likelihood of a new product launch. This supports the belief that it is necessary for firms in many industries to invest substantial amounts of resources in the development of new products to match the costs of new product launch, particularly in an industry such as the pharmaceutical industry with the almost prohibitive costs associated with new product launch (Smeal, 2002).

No positive association was found between technological complementarity and the likelihood of product launch, contrary to the theorized expectation in H4. The study focused on new product development alliances in the pharmaceutical industry, an industry renowned for the complexity of its research and development activities (Amir-Aslani and Negassi, 2006). Therefore, the observations might be due to an impediment to transferring complex knowledge across partners (Hansen, 1999) from different industries because of a lack of closeness between these firms and the knowledge base of these firms (Rindfleisch and Moorman, 2001). This lack of relational embeddedness between partners may lead to an inability to successfully complete the new product alliance and to bring the product to launch.

Managerial Implications

This research offers important implications for companies seeking collaborative ventures for the purpose of joint development of new products. First, managers should be concerned with the amount of resources potentially available to the collaborative project from the parent firms. Although the availability of these resources at a partner level does not decree the commitment of the resources, it does mean that the resources can be made available if necessary. Certainly potential partners firms without resources are less attractive partners from this perspective. Our findings indicate that both marketing and technological resources are vital to the likelihood of new product launch.

It is important that managers have a firm understanding of what resources the partnering organization will bring to the collaboration. Surprisingly, the findings did not indicate that technological complementarity was necessary for a successful product launch. However, the firms involved in the alliance must still recognize what capabilities the partnering firm is able, and willing, to provide. Each firm must also understand the expectations of the partnering firm. This, along with adequate marketing and technological resources, should enhance the likelihood of product launch success.

Directions for Future Research

Several limitations of the study should be acknowledged, and they provide avenues for future scholarly investigations. First, secondary data are employed in this analysis, placing limits to proxy variables used to represent the variables of interest. The proxy measures employed appear reasonable in terms of representing the conceptual constructs; nevertheless, they are not precise measures and should not be considered as such. It is therefore necessary for these results to be validated through alternative measures for key constructs.

Second, only a limited number of factors were examined to investigate the likelihood of new product launch. Marketing scholars should investigate the effects of other factors relating to new product launch. Additionally, this study focused specifically on the pharmaceutical industry. Future studies could expand the analysis to other industries as well. Such investigations should uncover valuable insights for firms involved in alliances with partner firms. Third, the sample includes only collaborative ventures that were dyadic relationships since all collaborative ventures with more than two partners were excluded. Future work could include collaborative ventures with more than two partners in any investigation.

An extension to the current study could involve examining the success of the products that were eventually launched. Such a study might investigate the determinants of product success resulting from the partnership of two (or more) firms. One might investigate whether the same factors necessary for successful product launch are also crucial to overall project success, the overall goal of the firms involved in the alliance. This would provide further guidance to firms involved in an alliance as to the requirements necessary for the ultimate success of the joint project. It is hoped that preliminary empirical findings revealed by the current study serve as the foundation for future investigations exploring those factors contributing to successful product launch in collaborative ventures.

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