THE EFFECT OF INTER-PARTNER RELATED-NESS ON STOCK MARKET REACTIONS TO JOINT VENTURE ANNOUNCEMENTS: DIFFERENCES BETWEEN MANUFACTURING AND MARKETING DEALS

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ABSTRACT

The degree of relatedness between a joint venture´s partners that maximizes the stock market returns upon its announcement continues to be a contentious topic in joint venture literature. With some prior findings suggesting that high inter-partner relatedness may be best for companies and other studies suggesting the contrary, the evidence on the matter is inconclusive. In this study, we found that returns are highest when inter-partner relatedness is neither too low nor too high. Further, we found evidence that the type of joint venture matters, with returns being significantly higher for highly related companies when they announce a marketing deal than when they announce a manufacturing one.

Key words: Joint ventures, Firm relatedness, Stock market returns

INTRODUCTION

A joint venture involves the pooling of two (or more) firms´ resources within a common legal organization (Kogut, 1988). Joint ventures are common business agreements, yet they are a challenge to managers because their probability of failure is high (Beamish & Lupton, 2009). Further complicating matters for managers is the fact that the impact of the decision to form a joint venture may be felt immediately. Upon the announcement of any particular joint venture deal, the stock market reacts, adjusting the announcing firms' values according to the impact that investors believe the venture is likely to have on the firms' cash flows (Koh & Venkatraman, 1991; McConnel & Nantel, 1985; Swaminathan & Moorman, 2009). As McWilliams and Siegel (1997) note, a negative reaction by the market can lead to a significant decrease, at least in the short run, to a firm's overall value.

Past research has shed light on a variety of factors that influence the stock market reaction to a particular joint venture announcement. These studies provided evidence that such diverse factors as ownership configuration (Park & Kim, 1997), cultural and institutional distance between partners (Merchant & Schendell, 2000) and joint venture experience (Anand & Khana, 2000; Gulati, Lavie & Singh, 2009; Kale, Dyer & Singh, 2002), among several others, can influence the market reaction to the announcement. Such studies inform us about the factors that might affect the processes that enable a firm to reap benefits from the resources involved in the venture. However, they inform us little about the nature of the resources brought to the joint venture by the partners that in the first place makes them amenable for possible synergy generation, and thus possible value creation. The degree of relatedness between two firms is one such factor that addresses the nature of the resources that may create value in the joint venture context (Koh & Venkatraman, 1991). Relatedness refers to the extent to which the firms' different lines of business or industries are likely to be able to be linked (Luo, 2002).

A common argument indicates that because firms from related industries generally possess resources that are similar (Teece, 1982), any collaboration between them has the potential to render cost-based (i.e., economies of scope) and/or revenue-based (i.e., market power) synergies that affect a firm´s cash flow positively. Suggesting that synergies of this type may be unavailable to deals between unrelated firms, some researchers have found that joint ventures announced by highly related partners produce a more favorable reaction from the stock market than those that are announced by unrelated partners (Chan, Kensinger, Keown & Martin, 1997; Garcia-Casarejos, Alcalde-Fradejas & Espitia-Escuer, 2009; Koh & Venkatraman, 1991).

Notwithstanding, another view suggests that related firms are likely to experience rivalry complexities and other non-cooperative behaviors that may stifle any synergies between them. Because such complexities arise mainly from overlapping of the firms´ competitive spheres (Park & Russo, 1996), they may be less likely to occur in the relationship between unrelated partners. In line with this argument, a variety of studies have found that the stock market reacts significantly and more positively to joint ventures announced by unrelated partners than to those announced by related ones (Balakrishnan & Koza, 1993; Johnson & Houston, 2000; Kumar, 2010; Park & Kim, 1997; Reuer & Koza, 2000; Sánchez-Lorda, 2006). Given the contradictory evidence, we still do not adequately know the level of relatedness that maximizes the stock market response to a joint venture´s announcement.

Further complicating the picture, several factors might alter the influence of firm relatedness on stock market reactions to joint venture announcements. The type

of deal that firms announce is one such factor. In the main, it is evident that the type of alliance that firms form signals the type of synergies they are attempting to reap from the venture. Past studies argue that horizontal, integrative, and scale alliances can generate cost-based synergies out of the sharing of similar resources that generate economies of scope (c.f., Dussauge, Garrette & Mitchell, 2000; Johnson & Houston, 2000; Park & Russo, 1996). They also provide evidence that vertical, sequential, and link alliances may generate revenue-based synergies derived from resource complementarities. Nevertheless, it is still necessary to examine in more depth if the effect of the inter-firm complexities that interfere with synergy generation varies across the different types of deals that firms announce with differently related partners. Because inter-firm rivalry and non-cooperative behavior depend, in part, on the specific resources that firms bring into an alliance (Kumar, 2010), we believe that operationalizing joint venture type by functional area (manufacturing versus marketing) helps to address such a gap in the joint venture literature. After all, the resources that firms bring into a joint venture differ according to the functional area in which firms want to collaborate through the alliance (Anand & Khana, 2000; Swaminathan & Moorman, 2009).

In the context of the previous gaps in the joint venture literature, in this study we draw on resource-based theory (Barney, Ketchen & Wright, 2011) to provide evidence concerning two inter-related questions. First, what is the association between a joint venture´s partners degree of relatedness and the stock market reaction to the venture announcement? Second, how does a joint venture´s functional area moderate such an association? Analyzing a sample of 214 joint ventures, our findings are in line with prior evidence indicating that inter-partner relatedness has a significant influence on stock market responses to a joint venture´s announcement. However, we contribute to the existing knowledge by suggesting and providing evidence that the market may exhibit sensitivity to the synergies generated by moderately related partners; i.e., synergies that are potentially unavailable to unrelated firms and that might be less affected by the complexities involved in the relationships between highly related partners. Also, advancing beyond prior knowledge, we found that the market reaction to manufacturing and marketing joint ventures can differ according to the level of relatedness between the announcing firms.

The rest of this paper is as follows. In the next section, we present the theory that promotes two hypotheses. Next, we describe the research methods employed to verify them and show the results of the empirical investigation. We finish with a discussion of the findings, the limitations of the research, and some opportunities for further studies in the area.

THEORY AND HYPOTHESES

Taking a resource-based perspective, some studies suggest that a high degree of relatedness between a joint venture´s partners might maximize the benefits of the partnership. Highly related firms, for example, are likely to control similar resources, which enables them to share plant capacity, facilities, expertise, and a variety of other tangible and intangible resources in order to reap economies of scale and/ or scope (Teece, 1982). Given their high product-market scope overlap, related firms might also be able to influence industry structure in order to gain market power (Pfeffer & Nowak, 1976). Unrelated firms, in contrast, can exhibit a high degree of resource dissimilarity between themselves, and thus economies of scale and/or scope are limited or absent in their collaborative associations. Therefore, joint venture formation between firms from related industries might improve the firms´ future cash flows more, and hence might trigger a more favorable reaction from the stock market analysts, than those between firms from unrelated industries. Several studies show evidence in this direction (Chan, et al., 1997; Garcia-Casarejos et al., 2009; Koh & Venkatraman, 1991).

Despite the above arguments and findings, a variety of studies report that joint ventures announced by unrelated partners may be the most valuable ones. Balakrishnan and Koza (1993), for example, argue that while resource sharing and other synergy potential between highly related firms may be possible, it is likely to be difficult to realize by means of a joint venture. They, and other researchers following the same line of thought (e.g., Reuer & Koza, 2000), argue that high relatedness between joint venture partners is likely to induce complexities associated with the management of a relationship with a competitor that can hinder synergy generation. Such issues as inter-firm rivalry (Park & Russo, 1996), learning races (Khana, Gulati & Nohria, 1998), and non-cooperative behavior in general (Kumar, 2010) may make it difficult for highly related firms to synergize. Unrelated firms are less likely to overlap in market scope and are thus less prone to such issues. Further, though unrelated firms may be less likely to reap synergy gains given their high degree of resource dissimilarity, they can still benefit from learning about a future acquisition target and/or market exploration for future expansion that may offset some synergy or market power losses (Kogut, 1991). In line with this view, various studies have found that the stock market generally reacts more positively to joint ventures announced by unrelated partners than to those announced by highly related ones (Balakrishnan & Koza, 1993; Johnson & Houston, 2000; Park & Kim, 1997; Reuer & Koza, 2000; Sánchez-Lorda, 2006).

While the evidence to date appears to be contradictory, resource-based theory provides a perspective through which to examine the possibility that stock market returns are higher when firms announce deals with partners that are neither highly related nor completely unrelated to them. As applied to the joint venture context, resource-based theory indicates that a joint venture may allow the participating firms to bring together some of their resources in order to reap various benefits that would be difficult to obtain otherwise. The result of the pooling of two firms´ resources can potentially be more valuable, rare, and more difficult to imitate and substitute than the results that could be obtained should such resources be kept apart without the inter-firm collaboration (Capron & Hulland, 1999). As discussed previously, firms can achieve competitive advantage when they share some of their similar resources in order to reap economies of scope and scale that can drive costs down (Koh & Venkatraman, 1991). They can also combine some of their resources that are complementary in order to exploit combinations that could be valuable and novel, and that can increase their revenue base (Schmidt & Keil, 2013). Cost-based and revenue-based benefits, however, might be lower when a joint venture´s partners are either highly related or unrelated than when they are moderately related.

When two firms are completely unrelated, they control dissimilar resources that are likely difficult to share in order to realize economies of scale and scope. The combination of complementary resources is also likely to be difficult in these conditions because firms need at least some amount of resource interdependence in order to combine their resources effectively (Milgrom & Roberts, 1995; Tanriverdi & Venkatraman, 2005). And even though forming a joint venture with an unrelated partner could produce other benefits, such as having the opportunity to learn about a future acquisition target or the exploration of new markets for future expansion (Kogut, 1991), such benefits are likely to materialize only in the long run. Because long run benefits are difficult for the stock market analysts to estimate at the moment of an event´s announcement (Zollo & Meier, 2008), short run benefits are more likely to produce a favorable reaction from them. Thus, even though the stock market reaction to joint venture deals announced by unrelated partners might be high, it is likely to be higher when firms form joint ventures with partners that possess resources that are dissimilar, but that are more likely to be interdependent and mutually supportive with theirs (Wang & Zajac, 2007). That is, the stock market reaction is likely to be higher to a joint venture between medially related partners that, as such, make it possible for a firm to reap synergies out of resource complementarities that can positively influence its cash flows in the short run.

Unlike partners with moderate levels of mutual relatedness, those with higher degrees of relatedness possess resources that are more likely to be similar than complementary (Tanriverdi & Venkatraman, 2005; Wang & Zajac, 2007), and are therefore more apt to realize synergies out of resource sharing. However, even when the benefits associated with different types of synergies could be equally valuable, joint ventures announced by highly related partners may be likely to produce a lower impact on a firm´s cash flow given the inter-firm complexities that can be experienced in such ventures. When a firm forms a joint venture with a related partner, it is usually managing a relationship that could be expensive to such a degree that the cost of forming and managing the venture could be higher than its benefits. After all, highly related collaborators are likely to be close competitors and hence could experience a series of competitive rather than cooperative dynamics that interfere with resource sharing (Kumar, 2010). Rival partners may each implement expensive administrative controls in order to deter the other´s opportunistic inclinations (Park & Russo, 1996). In line with this thinking, there is evidence to suggest that when a firm wants to share resources with a highly related partner, it usually prefers to acquire it as an attempt to eliminate the complexities of an alliance (Wang & Zajac, 2007). Because two less related firms are less likely to be close competitors (Park & Russo, 1996), joint ventures announced by moderately related partners are likely to be viewed as having the potential for a better impact on firm cash flows than those announced by highly related ones.

On the whole, the preceding arguments suggest two main points. First, unlike joint ventures announced by unrelated firms, those announced by moderately related partners are likely to produce synergies that can increase the partners´ cash flow in the short run. Second, unlike joint ventures announced by highly related partners, those that are announced by moderately related ones are less prone to experience the type of inter-firm complexities that might stifle synergy generation. This reasoning suggests the following hypothesis.

> Hypothesis 1: There is an inverted curvilinear association between the degree of relatedness between joint venture partners and the stock market reaction to the joint venture announcement.

There are reasons to believe, however, that the market could react differently depending on the functional area of the announced joint venture (Anand & Khana, 2000). A joint venture´s functional area is of interest because it is a significant determinant of the types of resources that firms bring together in the inter-firm col-

laboration and may therefore influence the likelihood of gaining synergies and/or facing competitive challenges. While a variety of functional area joint ventures are possible, we focus here on two that typically involve different types of resources – manufacturing joint ventures and marketing joint ventures. For example, firms may bring in such resources as machinery, plant capacity, manufacturing knowledge, processes, and technologies to manufacturing partnerships (Walters, Peters & Dess, 1994), but they may bring in brands, market knowledge, sales forces, and marketing management expertise when they form marketing joint ventures (Capron & Hulland, 1999; Swaminathan & Moorman, 2009).

Existing research does not provide sufficient evidence to make definitive claims regarding the differences in market reaction to manufacturing and marketing deals announced by firms. That said, the basic logic of relatedness provides a basis for the development of likely outcomes at different levels of relatedness between the joint venture firms. For example, the lack of similarity or complementarity among resources, found at low levels of relatedness between the partners suggests that the association between joint venture partner relatedness and the stock market reactions to the announcement of the joint venture is likely to be low for manufacturing as well as for marketing deals. Further, when inter-firm relatedness is medium, synergistic benefits could be more easily realized in both types of deals because the firms´ resources are more likely to produce valuable complementarities. However, when inter-firm relatedness is high, there are reasons to speculate that the stock market could react more favorably to marketing joint ventures than to manufacturing ones.

When a joint venture´s functional area is manufacturing and the degree of relatedness between the partners is high, inter-firm complexities are likely to hinder the benefits of the venture. When two manufacturing firms are highly related, they are likely to possess resources that can render cost-based synergies in the form of economies of scope (Dussauge, et al., 2000). Especially in regard to resources such as manufacturing knowledge and processes, however, similarity makes firms able to understand each other´s knowledge and capacities, and thus they can more easily appropriate the other´s resources and exploit them to their advantage (Park & Russo, 1996). When a joint venture partner attempts to appropriate resources, it is likely to be reciprocated with similar behavior, turning the partnership into a learning race or tit-for-tat situation that may stifle potential cost-based synergies in manufacturing contexts (Kumar, 2010). Additionally, shared decision making on machinery and plants is common in manufacturing alliances, and as each partner´s representatives try to maintain consistency between the alliance's operations and their own practices, the partners are virtually guaranteed to clash occasionally (Park & Russo, 1996).

All this might even elevate the costs of the joint venture above its benefits for one or both of the partners.

In contrast, when firms form marketing joint ventures and the degree of relatedness between them is high, they can still realize benefits that could have a positive impact on their cash flows. Marketing resources such as brands and sales forces are based on a firm´s substantial historical investments in marketing communications that result in superior consumer awareness and positive consumer attitudes toward brands and sales forces (Capron & Hulland, 1999). This might diminish the ability or desire of the partners to imitate one another, and thus reduce the probability of learning races in marketing contexts. In addition, because brands with strong equities have a considerable value when they are extended to new product variants or product categories (Capron & Hulland, 1999; Dacin & Smith, 1994), firms can enjoy monopoly gains based on all of the products to which a brand is extended through the joint venture. Chatterjee (1986) referred to these synergies as collusive and found them producing gains superior to those generated by cost-based synergies. In line with this evidence, Capron and Hulland (1999) found that such resources as brands, sales forces, and general marketing expertise produce revenue-based synergies that are more easily transferred between firms when the market similarity between them is high. Overall, the preceding arguments suggest the following hypothesis.

> Hypothesis 2: A joint venture´s functional area moderates the association between the degree of relatedness between joint venture partners and the stock market reaction to the joint venture announcement. This, in such a way that when relatedness between the venture partners is high, the stock market reactions are higher for marketing joint ventures than for manufacturing ones.

METHODS

Sample

Data to test these hypotheses were gathered as part of a more comprehensive study of firm strategies between the years 2000 to 2003. Lack of access to data after 2003 makes this year the forward limit of our time frame. In this study, a joint venture's announcement as reported by the SDC Platinum database is the unit of analysis. The sample was focused on only those joint venture deals involving two partnering firms announced during the years 2000 to 2003, and was further restrict-

ed by including only those deals in which at least one firm is a U.S. based public manufacturing company (SIC codes 2011-3999). Sampling U.S. based public firms ensures the availability of data on stock market reactions to a firm's joint venture announcement. Sampling manufacturing firms broadly controls for type of business and focuses on a business segment where firms experience strong incentives to form partnerships in order to respond to intense global competition and realize efficiency gains (Dussauge et al., 2000). For the purposes of the present study, our focal firms (those on which we focus the event study and the regression analysis) are the U.S. based firms that announced the joint venture.

A search in the SDC Platinum database produced 6476 joint venture announcements including two transacting companies during the years 2000 to 2003. According to the Center for Research in Security Prices (CRSP), in 1383 out of 6476 cases at least one of the firms had a publicly available stock price on the day of the joint venture announcement. After the elimination of cases where neither of the partners was a U.S. based manufacturing company, 334 cases were left in the sample. After checking the accuracy of the joint ventures' announcements in Lexis-Nexis, 104 observations were removed because there was no clear agreement regarding the joint venture announcement date and/or because the functional area of the venture was unclear. In line with the focus of Hypothesis 2 on the potential moderating role of joint venture functional focus, all of the observations retained were agreements specifically created to manufacture or to market a good.

After deletion of extreme outliers, a final sample of 214 joint venture announcements by U.S. based manufacturing firms was available for further analysis. As can be seen in Table 1, the sample includes roughly similar numbers of joint ventures with a manufacturing focus and with a marketing focus. Interestingly, the joint ventures included in the sample involved a significant number of partnerships with foreign firms (as non-focal firms), though these too were roughly evenly split between a focus on manufacturing and a focus on marketing.

Table 1

Sample Composition by Joint Venture Functional Area and Partner Origin*

Joint venture functional area	Joint venture partner status		Total
	International	Domestic	
Manufacturing	78	37	115 (54 %)
Marketing	62	37	99 (46 %)
Total	140 (65 %)	74 (35 %)	214

*Note: The focal firms in the sample are all U.S. based firms whose primary industry is manufacturing (SIC 2011 – 3999)

The sample is unevenly distributed in terms of joint venture activity across the years 2000 to 2003. Activity was highest in the year 2000 followed by a progressive decline in the following years. This distribution is consistent with a decline in the U.S. economy during the sampled years, and is also very similar to the distribution for the entire pool of 6476 observations initially extracted from SDC. In this regard, the elimination criteria discussed previously appear not to have biased the sample to any significant degree.

Our sample (214 observations) contains both diversified and non-diversified firms in terms of classification of the overall corporate portfolio. The total number of focal firms in the sample is 155 (some firms have more than one joint venture in the period studied). In this pool of firms, non-diversified firms make up the majority (85 non-diversified firms versus 70 diversified firms). Diversified firms, however, account for a majority of the observations included in the sample (128 cases for diversified firms versus 86 for non-diversified firms).

Variables Measurement

Dependent variable: Stock market reactions to joint venture announcements.

Following common practice in joint venture research within the strategy literature (e.g., Koh & Venkatraman, 1991), we operationalize this variable as the cumulative abnormal returns that firms experience in the stock market. We use a window of three days (-1, 0, +1) -that is, one day before the day of a joint venture announcement, the day of the announcement, and one day after. This three-day aggregation is undertaken in order to account for stock market reactions that may have been made before or after trading hours.

Cumulative abnormal returns are calculated by means of an event study following the method described by Brown and Warner (1985). The rate of return on the share price of firm i on day t is calculated by the equation: $R_{it} = \alpha + \beta_i R_{it} + \varepsilon_{it}$, where R_{it} is the rate of return of firm i's share on day t, R_{mt} is the rate of return on a given market portfolio of stocks, α is the intercept term, β equals stock i's systematic (or market related) risk, and ε_{it} is the error term. Based on this equation, a firm's abnormal return can be calculated by the equation: $AR_{it} = R_{it} - (a_i + b_i R_{mt})$ In this equation, a_i and b_i are the ordinary least squares parameter estimates produced by the regression of R_{it} on R_{mt} over the estimation period (T) preceding an event (e.g., 200 to 40 days prior to the event). AR_{it}, hence, represents the abnormal return, or the deviation

of a firm's stock price from the market price after investors have adjusted the firm's stock price as a consequence of the announcement of a specific event. Cumulative abnormal returns (CAR) for individual firms are obtained by accumulating AR_{it} over the event window. Data to carry out the event study were obtained from CRSP.

It is worth noting that the Fama-French four-factor model (Fama & French, 1996) is an alternative method to estimate abnormal returns that has gained prominence in the finance literature. In this study, however, we utilize the Brown and Warner (1985) market model because it is widely used in strategy research (e.g. Gulati et al., 2009; Kumar, 2010; Merchant & Schendel, 2000), and thus makes our results more directly comparable to others in this area. In addition, some alliances studies have found very similar results when they employ both estimation methods en parallel (e.g. Swaminathan & Moorman, 2009).

Independent variable: Joint venture partner relatedness.

We measured this variable following a validated approach by Merchant and Schendel (2000). This approach consists in identifying and counting the number of SIC codes that the firms in a joint venture have in common at the four-digit SIC level and then dividing this number by the total number of four-digit SIC codes that both companies cover. Because this operation produces a wide range of values between 0.0 and 0.5, just as Merchant and Schendel (2000), and Porrini (2004) did, we treat this measure as continuous. The extreme scores in this measure correspond to unrelated partners (0.0) and completely related partners (0.5). Data to calculate this variable were extracted from the SDC Platinum database.

Moderating variable: Joint venture functional area.

We operationalized functional area as a categorical variable that takes the value of one if a joint venture's functional area is manufacturing and zero if it is marketing. Initial categorization was based on data from SDC Platinum, which provides descriptions of the alliances' main purposes. These were then cross-checked in Lexis-Nexis for further accuracy.

In addition, we controlled for several variables that prior research indicates may influence the stock market analysts´ reaction to the announcement of a joint venture.

Control variables

Industry-adjusted firm profitability (focal firm). Poorly performing firms are expected to continue that way in the short run. Additionally, some industries are just more profitable than others. We deducted industry profitability from firm profitability. The former was calculated as the mean return on assets (ROA) of all the firms in an industry during a given year. The latter was measured as ROA for each firm in the sample during the years 2000 to 2003. In each case, ROA was averaged over two years to reduce bias caused by single-year outliers. Data were obtained from the Compustat database.

Firm size. Larger firms may have more resources to enhance the probability of alliance success (Kale et al., 2002). We measured this variable as the natural logarithm of firms´ total assets. Data were extracted from Compustat.

Firm leverage. Both favorable and unfavorable leverage positions can influence a firm's financial outcomes. For instance, highly leveraged firms may be less inclined to undertake unprofitable strategic actions because they are more closely monitored by creditors (Haleblian & Finkelstein, 1999). We measured a focal firm´s leverage as its total debt divided by its total assets. Data were extracted from Compustat.

Diversified firm. Based on the diversification discount hypothesis, diversified firms might experience less positive reactions from the stock market analysts to their strategic actions than non-diversified ones (Villalonga, 2004). In the analysis, we included a categorical variable that took the value of one if a focal firm was diversified and zero otherwise.

Joint venture ownership configuration. Ownership differentials can create incentives to cheat, as the partner with fewer resources invested in the venture may be tempted to undercut its contribution and free-ride on the contributions of the other partner (Park and Russo, 1996). We operationalized this variable as the square root of the subtraction of a firm's percent ownership minus the percent ownership of its venture partner. Data were obtained from SDC Platinum.

Joint venture partner cultural distance. This factor may be associated with inter-firm cooperation, conflict resolution, organizational learning, and some other phenomena that affect the potential benefits of joint venture formation between firms from different countries. We employed Kogut and Singh´s index (1988) with data from Hofstede, Hofstede, and Minkov (2010) to compute this variable.

Partner-specific joint venture experience. Prior research indicates that repeated experience with a specific partner increases the probability that a firm can

obtain benefits from joint venture formation. Thus, this factor may positively influ-ence the returns upon a joint venture announcement (Gulati et al., 2009). We counted all the prior joint ventures that a focal company had formed with the same partner precedent to a focal joint venture and used this measure as a control. Data were ob-tained from SDC Platinum.

Relatedness with the joint venture. A high level of relatedness on the part of one partner with the joint venture´s operations has a positive influence on the stock market reactions to a joint venture´s announcement (Garcia-Casarejos et al., 2009). We measured this factor using a variant of Haleblian and Finkelstein´s (1999) scheme to measure inter-firm relatedness. The level of relatedness between a focal partner and the joint venture took the value of one if a focal firm´s and the joint venture´s primary SIC codes matched at the level of two digit, two if the match was at the level of three digit, and three if the match existed at the four digit level.

Other control variables. Several other controls were taken into consider-ation during preliminary analysis. Year dummies were included to control for macro-economic effects on stock market reactions (the year 2000 was the base). Diversifi-cation degree was controlled by means of Teece, Rumelt, Dosi and Winter's (1994) index with data from Compustat. A categorical variable was included to control for the domestic-international status of the joint venture partner. Institutional distance between international joint venture partners was measured using Kogut and Singh's (1988) index with data from the World Bank Governance Indicators. These controls were removed from the final statistical output, however, as they produced strongly non-significant coefficients that, given our small sample size, deteriorated the esti-mation models´ level of significance and statistical power.

ANALYSIS AND RESULTS

Table 2 provides descriptive statistics for this study's variables. The results in this table indicate that the average cumulative abnormal return for the focal com-panies in the sample is 0.003 (SD = 0.053), a result statistically different from zero ($p < 0.05$). Putting this in perspective, the average value created for the firms under study was \$172 million, with 55 percent of the announcements resulting in gains. These results are in line with those reported in similar studies (e.g., Gulati et al., 2009; Swaminathan and Moorman, 2009), and do not vary significantly when the event window comprises the day of the announcement and the day before (window = -1, 0; CAR = 0.0031, $p < 0.01$), or when it includes the day of the announcement and the day after (window = 0, +1; CAR = 0.004, $p < 0.01$).

Keeping in mind that the measure of partner relatedness can vary from 0.0 (completely unrelated) to 0.5 (completely related), a perusal of Table 2 further indicates that the average degree of inter-firm relatedness is low (0.069). In other words, a considerable number of joint ventures announced during the years of analysis were announced between less related partners.

Table 2 also provides correlations among this study's variables. While there is no significant correlation between the stock market reactions to a joint venture´s announcement and the degree of relatedness between the announcing partners, this does not rule out a possible curvilinear relationship between these variables. Table 2 also indicates no significant association between stock market reactions to a joint venture´s announcement and the joint venture's functional area. Preliminarily, this is a positive result in terms of the hypothesized moderating role of joint venture functional focus, as moderator variables should preferably not be significantly correlated with the dependent variable in a regression equation (Baron & Kenny, 1986).

We employed panel data analysis techniques to test the hypotheses. The Hausman test indicates that Generalized Least Squares (GLS) random effects estimation is appropriate for the data at hand ($\chi2 = 21.93$, $p > 0.05$). Because this study´s data are a small and unbalanced panel, a Swamy-Arora adjustment is implemented as derived in Baltagi and Chang (1994).

Table 2
Descriptive Statistics and Intercorrelations of Variables

	M	SD	1	2	3	4	5	6	7	8	9	10
1 Stock market reactions to joint venture announcements	0.003 *	0.053										
2 Joint venture partner relatedness	0.069	0.105	0.056									
3 Joint venture functional area	0.537	0.500	0.003	0.054								
4 Industry-adjusted firm profitability	-0.058	0.542	0.028	-0.018	0.100							
5 Firm size	8.294	2.203	-0.056	-0.223 **	-0.029	0.130 †						
6 Firm leverage	0.282	0.172	0.050	-0.107	-0.010	-0.012	0.189 **					
7 Diversified firm	0.593	0.492	0.068	-0.108	-0.062	0.149 *	0.381 ***	0.100				
8 Joint venture ownership configuration	1.351	2.469	0.065	-0.048	0.027	0.047	0.037	0.001	-0.050			
9 Joint venture partner cultural distance	1.299	1.371	0.058	0.250 ***	0.053	0.084	-0.042	-0.045	0.009	-0.082		
10 Partner-specific joint venture experience	0.107	0.550	-0.189 **	-0.021	0.011	0.023	0.234 ***	0.052	0.093	-0.025	-0.06	
11 Relatedness with the joint venture	0.939	1.268	0.059	0.085	0.096	-0.082	-0.109	0.147 *	-0.130 †	0.106	0.128 †	-0.05

n = 214

† = p < .10. * = p < .05. ** = p < .01. *** = p < .001

Table 3

GLS Random Effects Estimation on Stock Market Reactions to Joint Venture Announcements

Variables	Model 1		Model 2		Model 3		Model 4	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Constant	0.004	0.016	0.0148	0.017	0.0139	0.0179	0.0148	0.0186
Industry-adjusted firm profitability	0.002	0.007	0.004	0.007	0.004	0.007	0.004	0.007
Firm size	-0.002	0.002	-0.002	0.002	-0.002	0.002	-0.002	0.002
Firm leverage	0.014	0.022	0.018	0.022	0.017	0.022	0.017	0.022
Diversified firm	0.012	0.008	0.012	0.008	0.012	0.008	0.013	0.008
Joint venture ownership configuration	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Joint venture partner cultural distance	0.002	0.003	0.001	0.003	0.001	0.003	0.001	0.003
Partner-specific joint venture experience	-.017**	0.007	-0.018**	0.007	-0.018**	0.007	-0.018*	0.007
Relatedness with the joint venture	0.002	0.003	0.001	0.003	0.002	0.003	0.002	0.003
Joint venture partner relatedness			0.1448*	0.063	0.2148**	0.0716	0.225*	0.097
Joint venture partner relatedness^2			-0.803*	0.337	-0.744*	0.337	-0.819	0.563
Joint venture functional area					-0.002	0.0073	-0.004	0.0106
Joint venture partner relatedness x Joint venture functional area					-0.139*	0.0689	-0.157	0.1287
Joint venture partner relatedness^2 x Joint venture functional area							0.1137	0.7016
R^2	5.7%		7.8%		9.6%		9.6%	
Wald χ^2	12.02		18.13*		22.51*		22.45*	

n = 214

t = p < .10. * = p < .05. ** = p < .01. *** = p < .001

Table 3 shows tests for this study´s hypotheses. It contains mean-centered variables to avoid multicollinearity problems between linear, quadratic, and interaction terms. Model 1 includes only control variables; it fits the data poorly (Wald $\chi2$ = 12.02, p > .10).

Hypothesis 1 suggests that there is an inverted curvilinear association between joint venture partner relatedness and stock market reactions to joint venture announcements. In Table 3, Model 2 contains, in addition to control variables, joint venture partner relatedness linear and quadratic terms. This model indicates that both the linear and the quadratic joint venture partner relatedness terms are significant and different from zero. Whereas the linear term is positive, the quadratic term is negative, a pattern that is consistent with a non-symmetric inverted U-shaped relationship as described by Aiken and West (1991). Model 2 fits the data well (Wald $\chi2$ = 18.13, p < .05). However, before claiming support for Hypothesis 1, we determined the inflection point associated with the nonlinear effects of joint venture partner relatedness on stock market reactions to a joint venture´s announcement. To do this, we calculated the first partial derivative of the regression equation shown in Table 3, Model 2. Such a point is 0.09. At this point, returns from increasing relatedness are at a maximum, and they begin to diminish. Note that 0.09 is higher than the mean joint venture partner relatedness of the sample (0.069). Still, given that the joint venture partner relatedness scale ranges from 0.0 to 0.5, the inflection point falls in the low range. All together, the evidence mentioned so far provides partial support for Hypothesis 1.

Hypothesis 2 predicts that joint venture functional area moderates the association indicated in Hypothesis 1. In Table 3, Model 3 includes a linear by linear interaction term (joint venture partner relatedness x joint venture functional area) in addition to the control variables, the linear and quadratic terms of joint venture partner relatedness, and the joint venture functional area linear term. Results from Model 3 indicate that not only is the interaction term significant, but also the linear joint venture partner relatedness term becomes stronger and more significant when the interaction term is present (i.e., compared to Model 2). Model 3 fits the data well (Wald $\chi2$ = 22.52, p < .05). To determine the point at which returns from increasing relatedness are at a maximum depending on whether the announced joint ventures' functional areas were marketing or manufacturing, we calculated the first partial derivative of the regression equation presented in Model 3. The point is 0.05 when the area is manufacturing, and 0.14 when it is marketing. All together, this evidence provides strong support for Hypothesis 2.

As a final test, Model 4, in Table 3, includes an interaction term formed by the joint venture partner relatedness squared term and the joint venture functional area linear term. The fact that this term is not significant and its inclusion does not improve the model fit suggests that the association predicted in Hypothesis 1 does not change the nature of its concavity (upward / downward) across different functional areas.

The results just described are presented pictorially in Figure 1. As can be seen, when a joint venture´s functional area is manufacturing, the association between joint venture partner relatedness and stock market reactions to a joint venture´s announcement follows a curvilinear pattern. However, this pattern is flatter than that for marketing joint ventures. Consistent with Hypothesis 2, Figure 1 shows that under conditions of high relatedness between joint venture partners, stock market reactions to marketing joint ventures are higher than those to manufacturing ones.

Figure 1
Stock Market Returns to Marketing and Manufacturing Joint Ventures
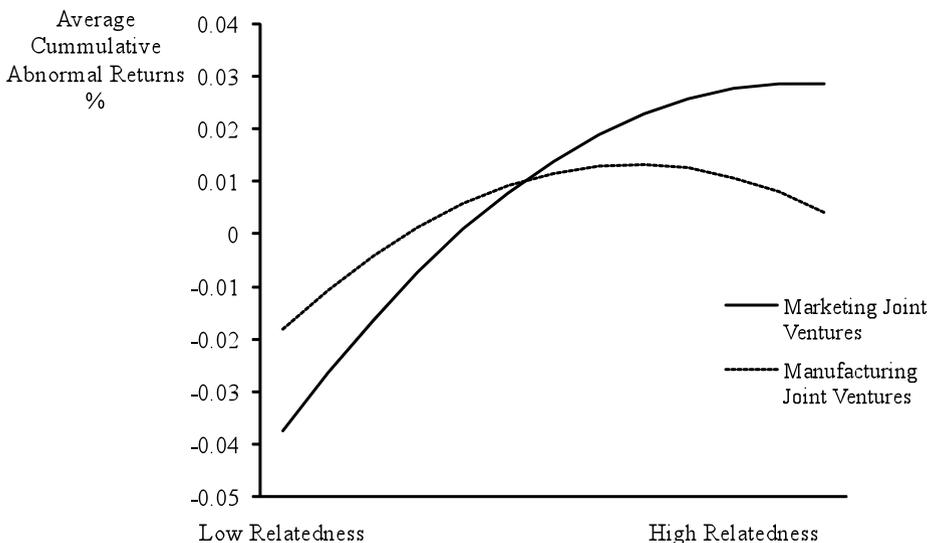
Before turning to the discussion of the preceding results, it is worth noting some additional pieces of information. Although R^2s in Table 3 are low, they are in accordance with most studies that use stock market reactions as the dependent variable (e.g., Haleblian & Finkelstein, 1999). Moreover, the results of Table 3 remain very similar even when stock market reactions are accumulated over a two-day (-1,

0 or 0, +1) rather than a three-day window. Finally, analysis for multicolinearity suggests that this is not likely to be an undue influence on the results. The highest Variance Inflation Factor (VIF) is returned for the squared Joint Venture Relatedness variable, but all VIFs are within acceptable ranges.

DISCUSSION

In this study, we aimed to contribute to the discussion about the factors that influence the stock market reaction to a joint venture´s announcement. In order to accomplish this objective, we focused on the degree of relatedness between a joint venture´s partners, as this factor speaks about the nature of the resources that firms bring into the collaborative agreement and the type of synergies and complexities that can be generated. In order to better understand this phenomenon, we also investigated the moderating role of joint venture functional area, as synergy generation and the inter-firm complexities that hinder it may depend on the actual resources that firms bring into the venture.

Results of this investigation both support and extend existing knowledge on the topic. At a broad level, and in accordance with the preponderance of the results in the pertinent literature, we found that the degree of relatedness between a joint venture´s partners has a significant effect on the stock market responses to its announcement. As such, it would appear that the market evaluates the potential value creation coming from joint ventures at least in part based on the level of relatedness between the two firms. The findings presented here, however, go beyond the existing contradictory evidence, as we found support for the argument, built from a resource-based theory foundation, that returns are at a maximum when the level of relatedness between the partners is neither too high nor too low. Interestingly, the results indicate that returns reach a maximum at a relatively low level of inter-partner relatedness, suggesting that while the market sees the potential synergies that may be available to moderately related partners and that are unavailable to unrelated firms, too much relatedness may raise concerns. While by no means conclusive in terms of cause, these results are in line with the view that synergies growing out of resource complementarities are best accomplished with a limited degree of relatedness. That is, the greatest gains may be found where achievement of such synergies is less likely to be hindered by the inter-firm complexities growing out of competitive concerns over resource similarities that can occur between more highly related partners.

The findings reported here concerning the differences in stock market reactions to manufacturing and marketing joint ventures are also in line with such a view.

We found that stock market returns are, in general, significantly higher for related partners when they announce a marketing joint venture that when they announce a manufacturing one. The archival nature of the data do not allow for direct assessment of the thinking that generated such results. A case can be made, however, that greater relatedness between partners in marketing based joint ventures is less likely to generate inter-firm complexities that might constrain the achievement of synergies. That is, because marketing deals do not generally require as much exchange of proprietary knowledge or skills as do manufacturing joint ventures, the benefits argued for relatedness may be more easily achieved for marketing joint ventures even when the partners are more highly related.

We recognize, though, that like all studies, there are limitations that suggest caution be used in extending or generalizing the findings presented here. For example, the fact that the sample contains many joint ventures announced by unrelated partners may have influenced the point at which the inverted association between inter-partner relatedness and returns upon joint venture announcements reached its maximum. Other studies with more balanced samples might examine if the inflection of the curve really peaks at the relatively low level of relatedness found here. Also, while suggestive, the nature of the data and approach utilized here does not allow for direct causal analysis nor allow for any direct observation of the thinking that is driving the stock market reactions to different joint venture announcements.

That said, the current findings should serve to encourage further research aimed at clarifying the controversies regarding the role of relatedness in explaining the benefits likely to accrue to joint ventures. Clearly, joint ventures remain a popular and appropriate means for firms to access and develop resources and capabilities in a timely and cost effective manner. Clarity regarding the most appropriate choice of partners for such ventures, however, has remained elusive. The current findings of an inverted relationship peaking at a relatively low level of relatedness and a moderating role on this relationship for joint venture focus add to our understanding. Both suggest that there is likely a balance to be found between having enough relatedness between partners to allow for the development of complementarities and having enough differences so that these complementarities can be pursued without undue competitive concerns between the partners. Thus, in the end, we hope that the present study serves as a stepping stone for future research in the choice of joint venture partners.

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