

Environmental Jolts and Strategic Alliances in the Aftermath of the 9/11 Terrorist Attacks

MURAD MITHANI

Howe School of Technology Management
Stevens Institute of Technology
Castle Point on Hudson
Hoboken, NJ
murad.mithani@stevens.edu

SHANTHI GOPALAKRISHNAN

School of Management
New Jersey Institute of Technology
University Heights
Newark, NJ 07102
gopalakr@adm.njit.edu

MICHAEL D. SANTORO

College of Business and Economics
Lehigh University
621 Taylor Street
Bethlehem, PA 18015
mds8@lehigh.edu

Submitted to the Academy of Management Meetings 2016.
Anaheim, CA.

No material from this paper may be quoted without prior permission from the authors.

Environmental Jolts and Strategic Alliances in the Aftermath of the 9/11 Terrorist Attacks

Abstract

This study extends the research on environmental jolts by incorporating the implications of geographical proximity and its impact on the use of strategic alliances. We argue that the implications of environmental jolts are subjectively perceived by organizations and that geographical proximity to the jolt increases the perception of risks and leads to heightened organizational activity to mitigate those risks. Thus, contrary to the conventional wisdom, we predict that firms closer to the jolt are more likely to exhibit a stronger response than firms that are farther away. Using data on global alliance activity in the oil industry prior to and subsequent to the 9/11 terrorist attacks, we find strong support for our arguments. We find that in the aftermath of the attacks, there was a general decrease in alliance activity. However, this decrease was significantly smaller for U.S. based firms relative to non-U.S. firms. The compensating efforts were more significant for U.S. firms with higher slack resources, and this in turn led to a higher frequency of inter-U.S. alliances. Our study makes a contribution by illustrating that a heightened perception of risk increases organizational capacity to withstand threats.

Keywords: environmental jolt, terrorism, strategic alliance, subjective risk perception, slack

INTRODUCTION

Environmental jolts represent unpredictable events that “are generally disruptive and inimical” for organizations (Meyer, 1982). However, the growing scholarship in this area leaves a critical question unanswered: Does organizational distance from the jolt affect a firm’s response? In this study, we investigate this question by focusing on the global alliance activity in the oil industry in the context of the 9/11 terrorist attacks in the U.S. Our findings suggest that proximity can be an important mechanism for building organizational capacity to withstand unforeseen threats.

Environmental jolts represent major economic and social disturbances that are brought about by events such as natural disasters (Muller & Whiteman, 2009), industry deregulation (Tao, Jiang & Santoro, 2013; Sine & David, 2003; Mitchell & Mulherin, 1996), financial crisis (Marino, Lohrke, Hill, Weaver & Tambunan, 2008; Pangarkar, 2007), or acts of terrorism (Goll & Rasheed, 2011). The implications of a jolt have been found to be strongest for those that are closest to the site of the event (Fischhoff, Gonzalez, Small, & Lerner, 2003). This makes proximity an important indicator of the potential of loss. However, research on the economic implications of terrorism offers a paradoxical conclusion. In the context of 9/11 terrorist attacks, a number of studies have found that while the impact of the jolt was global, U.S. markets not only experienced a smaller financial impact but they also exhibited a relatively prompt recovery compared to the non-U.S. markets (Brounen & Derwall, 2010; Chesney, Reshetar, & Karaman, 2011; Nikkinen & Vähämaa, 2010). The positive outlook of the U.S. market has been tied to the higher optimism exhibited by the U.S. firms (Eisendrath, Bernhard, Lucas, & Murphy, 2008; Li & Tallman, 2011). This raises an important question: *If proximity to the jolt increases the threat of loss, how is it that the U.S. firms exhibited stronger recovery than the non-U.S. firms?*

In this study, we address this question by comparing the strategic choices of U.S. and non-U.S. firms after the 9/11 attacks. We argue that subjective risk assessment can explain the heterogeneity in response frames. Firms that are closest to the jolt experience the highest level of threat. Their greater vulnerability increases the urgency to make strategic choices that can minimize the perceived exposure. We therefore predict that firms that are proximate to the threat are most likely to enter into risk-reducing activities such as strategic alliances compared to firms that are farther away. It is the aggressive pursuit of strategic choices that differentiates the implications for the proximate versus the more distant firms. We will examine this issue by using the context of the global oil industry, where we compare the alliance activity of 174 firms from 28 countries before and after the 9/11 attacks. In pursuing this line of inquiry, our study contributes to the literature by demonstrating that subjective risk perceptions that emanate from proximity to a jolt can induce significant variations in strategic behavior. These variations explain the more optimistic response by the U.S. firms. Thus, we will show that rather than being a liability, proximity to the jolt may actually be beneficial since it can serve as a mechanism for building organizational capacity to withstand environmental threats.

THEORY AND HYPOTHESES

Environmental Jolts and Terrorism

Environmental jolts represent highly unpredictable events with significant implications for organizations. They can affect the supply of resources, the predictability of the demand, and raise significant questions on the perpetuity of the existing competitive landscape. The resulting uncertainty requires critical changes in organizational actions. To a large extent, the research in this area offers an optimistic view of organizational adaptation. In one of the earliest studies on environmental jolts, Meyer (1982) found that in the wake of a doctor's strike, hospitals with a

shared and consistent ideological outlook accompanied by an active strategic response were highly successful in thwarting patient and economic losses. In a study of the electric power supply industry in the U.S., Sine and David (2003) found that the onset of deregulation led to the emergence of new entrepreneurial opportunities. Focusing on alliance activity in the U.S. after the dramatic decline in e-commerce stocks, Park and Mezias (2005) showed that the stock market was more responsive to alliances that went beyond the firms' immediate technological domain. Similarly, Wan and Yiu (2009) found that while acquisitions are generally a risky strategy, they were beneficial for firms during the Asian economic crisis. This effect was particularly salient for firms with higher slack resources. Consistent with Meyer's (1982) work, these studies highlight the role of 'ideological' and 'strategic' choices in organizational adaptation to environmental jolts (also see Li, Tallman, & Ferreira, 2005).

However, the question of organizational adaptation has remained difficult to answer in the context of terrorist attacks (Brück & Wickström, 2004; James, 2011). The September 11th 2001 attacks (or the 9/11 attacks) in the U.S. are widely recognized as one such discontinuous and sudden jolt that led to significant changes both in the social and the economic environments (Johnston & Nedelescu, 2006; Larobina & Pate, 2009). Expressing the fear of global economic slowdown, the United Nations' Department of Economic and Social Affairs (2001) stated that:

[T]he attacks of 11 September inflicted a sizeable adverse "shock" on the world economy and may cause significant changes in a number of key determinants of the global economic outlook. . . .The direct economic consequences of eroding confidence will be heightened risk aversion by business investors and a withholding of household spending by consumers. The nervousness and apprehension of investors and consumers may lead not only to depressed demand in the short-to medium run, but also to reduced expansion of supply capacity and lower potential long-term growth (p. 3, 5–6).

However, subsequent findings suggest that while there was a major decrease in the market capitalization of firms following the 9/11 attacks, the duration and magnitude of impact

was significantly muted for the U.S. firms compared to their counterparts in the rest of the world (Brounen & Derwall, 2010; Chesney et al., 2011; Nikkinen & Vähämaa, 2010). The findings suggest that rather than a decrease, the U.S. firms' geographical proximity to the attacks led to a relative increase in the focus on economic activity. This evidence is difficult to reconcile. That is, if proximity increases the social and economic implications of the jolt, why did it lead to greater economic activity for the U.S. firms compared to the rest of the world?

Subjective Risk Assessment

One way to reconcile these findings is to take into account the subjective nature of risk assessment. Subjective risk assessment refers to differences in individual responsiveness to identical threats. It represents a cognitive bias that arises from the disproportionate perception of an issue by the observer (Kahneman, 2010). Although there may be several factors that can contribute to subjective differences in risk perceptions, the research on terrorism has emphasized the role of geographical proximity. It refers to the extent to which those who are physically closer to a terrorist attack are more likely to view themselves as the target of a future attack. For example, Fischhoff and coauthors (2003) studied people living within 100 miles of the 9/11 attacks and found that their fear of a repeated attack was significantly higher than those living at larger distances (also see Sacco, Galletto, & Blanzieri, 2003). Mandel (2005) explained that “the magnitude of perceived risk increases with media exposure, feelings of dread, expectations of fatality, and a perceived lack of control” (p. 277). Although these feelings are not completely absent from those that are farther away (Marshall et al., 2007), the effect has been found to escalate with proximity and it can persist long after the attack (Schuster et al., 2001; Silver, Holman, McIntosh, Poulin, & Gil-Rivas, 2002), possibly for several years (Holman et al., 2008; Suvak, Maguen, Litz, Silver, & Holman, 2008). Other studies have shown that the exaggerated

fear and the disproportionate incidence of post-attack stress (Blanchard et al., 2004; Schlenger et al., 2002) can induce ‘false memories’ leading to more aggressive behavioral consequences (Ost, Granhag, Udell, & Roos af Hjelmsäter, 2008). The increased sense of vulnerability has been associated with a greater emphasis on precautionary measures (Lerner, Gonzalez, Small, & Fischhoff, 2003) in order to overcome the effects of stress (Hasin, Keyes, Hatzenbuehler, Aharonovich, & Alderson, 2007). Kahneman (2010) further elaborates that:

My experience illustrates how terrorism works and why it is so effective . . . An extremely vivid image of death and damage, constantly reinforced by media attention and frequent conversations, becomes highly accessible, especially if it is associated with a specific situation such as the sight of a bus. The emotional arousal is associative, automatic, and uncontrolled, and it produces an impulse for protective action . . . The emotion is not only disproportionate to the probability, it is also insensitive to the exact level of probability (p. 314).

Thus, despite the extremely low odds of the repetition of a terrorist attack at the same location (National Research Council, 2002), individuals proximate to the site of an attack experience strong psychological responses in addition to the relatively higher exposure to the social and economic challenges associated with an attack (Drakos, 2004). This can lead to a greater attention to choices that can minimize the perception of risks (Suder & Czinkota, 2005; also see Lerner et al., 2003; Ost et al., 2008). At the organizational level, an important mechanism to reduce the potential of perceived environmental risks includes working with another organization through inter-organizational alliances. We discuss below how organizational exposure to threats can influence the frequency of strategic alliances.

Organizational Risk and Strategic Alliances

Strategic alliances are voluntary inter-firm arrangements involving the exchange, coordination, sharing and/or joint development of resources and capabilities (Gulati & Singh, 1998; Park & Mezas, 2005) that allow firms to share the investment, risk, and also take

advantage of complementary resources (Rosenkopf & Almeida, 2003; Rothaermel & Deeds, 2004). Alliances serve as a mechanism through which organizations acquire newer skills without a formal change in their boundaries. They make it possible for firms to cope with major environmental shifts without dramatic changes in internal processes. Moreover, alliances also serve as an emotional buffer where mutual cooperation allows firms to share their uncertainties and fears. This arrangement helps overcome the risk of competitive obsolescence by establishing a learning pathway between alliance partners. As a result, alliances enable firms to buffer themselves from the uncertainty of a future environmental jolt by augmenting resources, spreading the risk and enhancing reputation (Varadarajan & Cunningham, 1995). Although strategic alliances can also pose the risk of opportunistic behavior by the partner or the potential of creating newer dependencies (Hamel, 1991; Marino, Lohrke, Hill, Weaver, & Tambunan, 2008; Pangarkar, 2007), the benefits of organizational rejuvenation in the face of a changing competitive environment generally overcomes the hazard of an opportunistic alliance partner.

However, these implications are likely to be different when the environmental jolt is associated with a terrorist attack. That is, some jolts can cause just economic uncertainty but others can lead to psychological distress as well. A jolt that leads to economic uncertainty makes it pertinent for the organization to rapidly incorporate change by identifying the skills that are likely to be valuable in the future (Park & Mezias, 2005; Wan & Yiu, 2009), while a jolt that induces psychological fear undermines the benefits of change (Ricart, Enright, Ghemawat, Hart, & Khanna, 2004). The diminishing consumer and investor confidence exacerbates the difficulty of determining competencies that are likely to be of value (United Nations & Department of economic and social affairs, 2001). Under these circumstances, alliances can lock firms into commitments that may have limited benefits, or at worst, consume resources towards the

development of skills that increase the rate of obsolescence (Denrell & March, 2001; Levinthal & March, 1993). Thus, rather than being a mechanism for risk-reduction, strategic alliances in the event of a major terrorist attack¹ can increase organizational exposure to risks. They may create organizational inertia as resources may need to be redirected from routine operations to other restructuring activity (Hannan & Freeman, 1984). This conservation of resources is necessary to protect against the threat of diminishing demand or against the possible changes in national priorities (United Nations & Department of economic and social affairs, 2001). It also limits organizational dependence on others that can be a liability when the future state of the environment is difficult to predict. This suggests that in the face of a terrorist attack, firms will exhibit a decrease in the frequency of strategic alliances. This decrease will serve as a mechanism for insulation that can limit organizational exposure and facilitate the conservation of resources when the future state of the environment is unclear. This leads to our baseline hypothesis:

Hypothesis 1: Alliance activity will decrease subsequent to a terrorist attack.

In addition to their role in competence development, alliances are an important source of social capital (Koka & Prescott, 2002; also see Das & Teng, 2002). They can allow firms to develop a wider understanding of the changes in the environment while serving as an emotional buffer to diffuse the shock of the attack (Doerfel, Lai, & Chewning, 2010; Monge et al., 1998). In addition, the resulting coordination can serve as a source of valuable information on the developments in the economic and the institutional environments. These considerations are particularly more valuable for firms that are proximate to the jolt. Their higher relative exposure

¹ As our focal event is the 9/11 terrorist attacks in the U.S., we refrain from emphasizing the magnitude of the jolt. It should be kept in perspective that the applicability of our arguments will be weaker in the case of smaller-scale terrorist events.

and greater subjective vulnerability make it critical for these firms to make choices that can diminish the perceived risks. Given their exaggerated fear of threats, proximity to the jolt increases the sensitivity and need for external information. Their threat of inactivity is likely to supersede the fear of an ineffective commitment, making the benefits of alliance more salient than the associated constraints (Chattopadhyay, Glick, & Huber, 2001; Dutton & Jackson, 1987; Thomas, Clark, & Gioia, 1993). Under these circumstances, firms may view alliances as “unorthodox experiments that revitalize them, teach lessons that reacquaint them with their environments, and inspire dramas celebrating their ideologies” (Meyer, 1982: 535).

Thus, consistent with the previous research which suggests that subjective risk preferences may emanate from managerial sensitivities (Jordan & Audia, 2012) or contextual cues (Greve, 2011; Miller & Bromiley, 1990), we argue that stylized situations (Kahneman & Tversky, 1979) and in particular, geographical proximity to an event can influence the nature of organizational reactions. It can lead to a relatively higher commitment towards alliances. These commitments are less likely to be shaped by competitive deficits and more closely structured around the sharing of information and the strengthening of inter-firm coordination as an emotional buffer. This leads us to predict that despite the diminished preference for alliance activity in the face of a terrorist attack, firms’ geographical proximity to the attack will make them relatively more open to new partnerships. They will view strategic alliances as an important experiment to overcome the risk of inactivity and minimize the heightened perception of threats. This leads to the hypothesis:

Hypothesis 2: The decrease in alliance activity will be less significant for firms that are more proximate to the terrorist attack than firms that are farther away.

Firms that have excess resources, or slack, have greater capacity to shield themselves from environmental jolts (Cheng & Kesner, 1997; Singh, 1986). Slack provides an economic cushion that diminishes the intensity of threats. It allows the organization to perpetuate historical choices and to function with minimal changes in routines (Cyert & March, 1963; Gittell, Cameron, Lim, & Rivas, 2006). While organizations are likely to diminish their attention to alliances and less so if they are proximate to the jolt, the cushioning effect of financial resources suggests that proximate firms with higher slack resources will be even less likely to suppress their alliance activity.

In addition to the perpetuation of the internal momentum, slack resources also change the way external factors affect organizational choices. Markets are more critical in the evaluation of firms with higher slack resources. When the general economic forecast is pessimistic, firms with higher slack become the prime targets of shareholder expectations. On the one hand, investors are prone to raise their demands from well-endowed firms as a means to balance the value of their portfolio that is threatened in the event of a jolt (e.g. Brounen & Derwall, 2010; Henisz, Dorobantu, & Nartey, 2013; Lines, 2004). On the other hand, resource endowments can increase the perceived risk by exacerbating firms' vulnerability to future attacks, making shareholders concerned about their perpetuity in the face of future shocks (see Fischhoff et al., 2003). In contrast, fewer resources not only limit strategic maneuverability but they also decrease shareholder concerns regarding the threat of future losses (Berkman, Jacobsen, & Lee, 2011; Rosner, 1968). This suggests that slack resources will invite greater pressure for the preservation of shareholder wealth and therefore a stronger external impetus for action. The joint effect of higher subjective perception of risk by proximate firms and greater external pressure for the preservation of organizational value suggests that proximate firms with higher resources will

exhibit a stronger adaptive response. They will exhibit a greater emphasis on the formation of new alliances to continue to rejuvenate their capabilities. Although one may argue that firms with limited slack will be more eager to ally in order to diminish their exposure to environmental threats, it is not difficult to imagine that such firms will be less attractive targets for potential alliance partners (Santoro, 2000). This will decrease the possibility that firms with limited slack will be successful in forming many alliances in the aftermath of an attack. Thus, we predict that proximate firms with higher slack are likely to form more alliances in the aftermath of an attack. Even though these alliances may play a limited role in the rejuvenation of organizational skills, they are a symbolic demonstration of organizational attention towards adaptive change. This leads to our hypothesis:

Hypothesis 3: The relationship between proximity to the terrorist attack and alliance activity will be positively moderated by slack.

We have argued that the subjective perception of risk and the external expectations of action are higher for firms that are proximate to the jolt. This suggests the potential of asymmetric preferences amongst firms that are geographically closer versus those that are farther away from the attack. These differences can manifest into variations in partner expectations of the goals of the alliance (Park & Mezas, 2005). This suggests that in the aftermath of a jolt, firms will be less likely to ally with partners with significant differences in risk perceptions. They will be more likely to find partners that share their view of environmental risks. This leads us to predict that the jolt will induce an intra-industry partitioning amongst firms such that firms that are more proximate to the jolt will be eager to develop ties with other proximate firms that hold a more consistent outlook towards threats. Similarly, distant firms with a lower tolerance for

risks will be less keen to form newer alliances and when they do, they will be more likely to pick partners that have a comparable outlook due to higher relative distance from the jolt. Given the perceived higher exposure to future threats, the tendency to match risk perceptions amongst partners is likely to be stronger amongst the proximate firms. They are more dependent on their social networks as a mechanism to overcome the stress that accrues from possible future attacks (for e.g., see Bader & Schuster, 2015). This tendency is likely to lead to a greater relative preference for local alliance partners. Thus, the contrast in risk perceptions will induce a geographical clustering of alliance activity such that there will be a greater likelihood of alliances between firms that are geographically proximate to the event and fewer alliances between proximate and distant firms. This implication for geographical confinement of alliance activity in the aftermath of a terrorist attack leads us to hypothesize that:

Hypothesis 4: The relationship between proximity to the attack and alliance activity will be positively moderated by the geographical confinement of partner selection. Proximate firms will have more alliances with partners who are also proximate to the attack.

METHODOLOGY

Setting

We focus on comparing the alliance activity of U.S. firms due to their proximity to the 9/11 terrorist attacks, to that of the relatively distant non-U.S. firms. Consistent with previous studies, we use the national boundary to identify the extent to which a firm was more directly affected by the attacks (Brounen & Derwall, 2010; Chesney et al., 2011; Nikkinen & Vähämaa, 2010). However, the comparison of proximate and distant firms can misrepresent the pre-existing differences between firms from different countries. It is not difficult to imagine that the U.S. and

the non-U.S. firms may differ in their alliance activity regardless of the terrorist attack. A failure to recognize these differences can lead us to erroneously view those differences as a manifestation of the attack. An effective comparison therefore requires the incorporation of the alliance activity prior to the attack to establish the baseline for a comparison of alliance activity subsequent to the attack. We discuss this in greater detail when elaborating our analytical approach. The biggest challenge for our analyses is the identification of a comparable industrial context. Since national boundaries can influence the nature of products and services, a cross-national comparison may be difficult unless the focal products are largely identical across the globe (Baum, Dobrev, & Witteloostuijn, 2006). We chose the oil industry as our empirical setting. Not only are the underlying products highly standardized across the world, the oil industry is highly vulnerable to terrorist attacks (Blomberg, Hess, & Jackson, 2009). To this point, immediately after the 9/11 attacks, the New York Times reported that “[t]he price of crude oil, which was around \$30 per barrel earlier this year, plunged last week to as little as \$17, with warnings that it could go still lower” (18-Nov-2001). In addition to the direct effect, the consumption of oil was also affected by changes in the national priorities. For example, a report to the U.S. Congress highlighted that:

[l]arge amounts of resources are and will be committed to making production, distribution, finance, and communication more secure in the United States. Resources that could have been used to enhance the productive capacity of the country will now be used for security (Makinen, 2002: CRS-2).

These changes led to an uncertain outlook for the oil industry. Due to the commoditized nature of the product, these implications were not limited to the U.S. The changes in the supply and the demand for oil influenced the market sentiment across the globe. Moreover, the use of alliances in this sector has become a prominent strategic initiative. It is a response to the increasing pressures on the overall sector to innovate and find new energy sources and

distribution methods due to the combination of increasing demand from emerging economies, increased competition within the sector, and ecological and socio-cultural pressures to find and distribute energy sources safely and cost-effectively (Russo, 2001; Sine, David, & Mitsuhashi, 2007). Since a pessimistic market outlook can be a formidable deterrent with severe consequences for investments, the oil industry offers an ideal context to examine how the growing market uncertainty influenced organizational choices in terms of the alliance activity.

Sample

We developed our sample from two primary sources. We began with the identification of oil (petroleum) refining and marketing companies from around the world whose financial information was publically available. For this we used Bloomberg, the world's largest supplier of listed company information. It separates the information on the oil industry into integrated and non-integrated producers. Integrated producers include firms that have their own exploration and marketing operations, and non-integrated producers rely on external entities for their supplies or distribution. We included both categories of firms in our sample. The primary advantage of Bloomberg is that it offers a single source of information for firms across multiple countries and the reported data is uniform in terms of the underlying measures. After eliminating duplicates and missing values, we were able to identify 174 firms from 28 countries (including the U.S.). We used corporate headquarters as the primary location of the firm as identified in Bloomberg. Although it is not unusual for the oil companies to have their exploration and distribution facilities in multiple countries, corporate headquarters remains an effective representation of the point for key decisions since most top executives are generally present at this location (Palmer, Friedland, & Singh, 1986; Tilcsik & Marquis, 2013). To validate this information and to ascertain that the corporate headquarters did not move during the sample period, we tracked the

company history from multiple sources including the corporate websites, company press releases, Hoovers, and other public sources. We found that although in several cases the corporate headquarters moved across cities, it remained within the same country². Of the 174 firms in our sample, 31 are from the U.S. and the remaining 143 firms are from the other parts of the world. A complete list of countries included in our sample is shown in the Appendix. Next, we collected the financial information for each of these companies. The firm-level financial information in Bloomberg starts from 1991, which served as the starting point for our sample. We continued until the most recent year, which was 2012. This produced a total of 22 years of data that equally spanned the years preceding the focal event (1991 – 2001 = 11 years) and the years subsequent to the event (2002 – 2012 = 11 years).

We used SDC Platinum to identify the alliance activity. It is one of the most comprehensive sources of information on strategic alliances. The primary benefit of SDC is its extensive global coverage (see Schilling, 2008). However, there are two potential limitations of SDC. First, public access to information during the pre-Internet era was relatively difficult to access, which makes it likely that the alliance activity may be systematically inflated in the more recent years. This suggests that when comparing the frequency of alliances prior to and subsequent to 9/11, we are likely to find it difficult to establish our baseline hypothesis regarding the decrease in the frequency of alliances after the attacks. We believe this increases the conservativeness of our findings. If alliance activity is systematically inflated in the more recent years but our argument suggests a decrease in alliance activity after 9/11, support for our hypothesis will lead to a more robust validation of our underlying argument. A second limitation is that SDC may have greater coverage for the U.S. and other more developed economies than

² One exception was Caltex, whose corporate headquarters moved from Singapore to the U.S. for two years prior to 9/11. We maintain it as a non-U.S. location throughout the sample period.

the less-developed or relatively remote locations such as Nigeria or Russia. Although this is unlikely to be a critical limitation since the greater visibility of oil companies around the world generally leads to the pertinent information relayed across multiple channels, we chose to evaluate the potential of a systematic bias. We collected the information on all alliances reported by 30 non-US firms from 15 countries from their websites and annual reports and compared this information with that reported in SDC. We found a 100% match that validated that there was no systematic omission of the coverage of alliance activity for our sampled firms. To collect the information on alliances, we manually searched each firm in our sample in SDC and then tracked their respective alliances over the sample period. The manual search was necessary due to the lack of availability of a common identifier between Bloomberg and SDC³. This led to the identification of a total of 2,398 alliances for our sample of which 247 were by the U.S. firms and the remaining 2,151 were associated with the non-US firms⁴.

In Table 1, we show a comparison of the average alliance activity per firm before and after the attacks. Consistent with our argument, it shows a significant decrease in the overall activity from 2.29 to 0.67 alliances per firm. Even though U.S. firms have fewer average alliances before and after the attacks, the decrease is less than half, from 0.96 to 0.53. It is much more significant for the non-U.S. firms, which go from an average of 2.72 alliances to 0.70 alliances per firm corresponding to a decrease of almost two-thirds in the average number of alliances per firm. Figure 1 offers a graphical illustration of the alliance activity. Inset A shows the alliance activity over the sample period (i.e. Jan 1991 to Dec 2012) while inset B shows the

³ Although ISIN from Bloomberg can be mapped to CUSIP in SDC, it was not available in several cases. Even when available, it failed to successfully map several non-US firms.

⁴ These alliances included those between the sampled and the other (non-public) firms, and between sampled firms. For alliances between two or more sampled firms, they appear more than once respectively for each of the partners.

activity closer to the 9/11 attacks (Jan 1999 to Dec 2003). It offers a visual illustration of the decrease in alliance activity after the attacks. Interestingly, the decline can be seen to begin within a few months after 9/11 suggesting the immediate impact of the attack.

- - - Insert Figure 1 and Table 1 about here - - -

Variables

Dependent and Independent Variables. We operationalize *alliance activity* as the total number of alliances per firm per year. Higher values indicate that the firm actively pursued information sharing and coordination with other organizations. To identify firm proximity to the jolt, we use a binary variable. *U.S. firms* are identified with a value of 1 and firms outside the U.S. are coded as 0 (Fischhoff et al., 2003). We distinguish between firm responses prior and subsequent to the attacks through the variable *post-attack*. It is 1 for all observations between 2002 and 2012 and 0 for the earlier years (e.g. Kacperczyk, 2009). We use two different measures for slack. First is the ratio of *debt/assets*. Higher values indicate smaller slack. A second measure is the current ratio. It is operationalized as *current assets/current liabilities*. Higher values represent greater level of slack (Iyer & Miller, 2008). To construct a measure for *geographical confinement*, we use the proportion of firms' alliances with others with similar psychological distance from the jolt. For the U.S. firms, we divided the number of domestic alliances for the focal firm with their total alliances in the year. Similarly, for the non-U.S. firms, we divided the number of alliances with other non-U.S. firms by their total number of alliances per year (for e.g. see Park & Mezas (2005) who used a binary variable for industry sector confinement). This gives a continuous measure with higher values indicating greater geographical confinement of alliance activity. We also tested by replacing the continuous variable with a dummy (i.e. 1 for U.S. to U.S. alliances and non-U.S. to non-U.S. alliances and

zero otherwise) and found the results to be completely identical. An alternative could also be to further differentiate between the non-U.S. alliances based on the national boundaries. However, this would be inconsistent with our argument since our focus is on examining if the proximate firms increased the selection of proximate partners and firms distant from the jolt increased their preference for the other distant firms, with the latter being independent of national boundaries.

Controls. We control for firm size as the logarithmic value of annual *sales* (+1). To ensure firms propensity towards alliances is not affected by new investments, we control for *capital intensity*. It is the ratio of total capital expenditures to annual sales. We also control for R&D intensity - ratio of R&D expenses to annual sales to ensure that larger resources invested into R&D do not affect the alliance activity. To distinguish between integrated and non-integrated firms, we include a dummy variable *integrated* that is 1 for firms that span across the supply and distribution channels and 0 otherwise. In order to account for the possibility that changes in the alliance activity are not simply a response to changes in the price of oil (particularly for hypothesis 1), we include *oil price* as the average value in US dollars of a barrel of crude oil across the year. This data were obtained from the US Energy Information Administration⁵.

Analytical Model

Our analysis focuses on firm-level differences (i.e. U.S. versus non-U.S. firms) as well as changes in the frequency of alliances over time (i.e. pre versus post attack). The most appropriate analytical approach to obtain the joint implications these affects is the difference-in-difference (DiD) model (Kacperczyk, 2009; Reeb, Sakakibara, & Mahmood, 2012). It identifies the extent

⁵ Notice that we do not control for the nature of alliance (i.e. R&D, manufacturing, marketing, etc.). This was necessary to avoid the possibility of endogeneity. Since our dependent variable represents the frequency of all types of alliances, it correlates with the number of any specific type of alliance that can inflate standard errors and yield a systematic bias.

to which firms behave differently after the jolt keeping in context their relative differences prior to the event. If firms behave differently but the differences are not significantly different prior and subsequent to the event, the result yields an insignificant effect. Similarly, if the firms behave differently after the attack but their differences are consistent with their behavior prior to the event, the result yields an insignificant effect. In contrast, a significant effect can validate that not only did the proximate as well as the distant firms experienced changes in alliance activity after the attack, the trajectory of changes was significantly different for the U.S. and the non-U.S. firms. Thus, in estimating the effects, DiD controls for the past alliance activity as well as the relative differences between the firms. It does so by using two distinct dummy variables and the significance of the DiD effect is ascertained by the interaction between the two dummies. They include *post-attack* which differentiates between observations subsequent to the event from those that are prior to the event, and *U.S. firms*, which distinguishes the proximate from the distant firms. A significant interaction between *post-attack* and *U.S. firm* can validate the two conditions identified above as illustrated by the following equation:

$$y = \beta_0 + \beta_1 \cdot \text{post-attack} + \beta_2 \cdot \text{U.S. firm} + \beta_3 \cdot \text{period} \cdot \text{U.S. firm} + \sum \beta_k \cdot \text{controls} + \varepsilon$$

Here y represents *alliance activity* and β_3 is the coefficient that captures the DiD effect by interacting the comparative changes in *U.S. firms* over the *post-attack* period. β_3 is significant only if the outcome variable for U.S. firms (compared to the non-U.S. firms) is significantly different in the *post-attack* period after the 9/11 attacks (t_2) relative to their difference prior to the attacks (t_1). That is:

$$\beta_3 (\text{est.}) = (y_{US-t_2} - y_{US-t_1}) - (y_{nonUS-t_2} - y_{nonUS-t_1})$$

The DiD effect is the focus of hypothesis 2. In subsequent hypotheses, we examine how the DiD effect is influenced by slack (hypothesis 3) and geographical confinement (hypothesis

4). However, when establishing the baseline effect predicted in hypothesis 1, we focus on the coefficient β_1 which pertains to a difference model. It simply captures the comparative change in alliance activity after the attack compared to the activity prior to the attack. Since we have multiple observations per firm, we run our estimation models by accounting for the longitudinal nature of our sample. For this, we use the generalized least squares (GLS) models with random effects. They allow us to account for the effect of multiple observations per firm while acknowledging the potential of correlation within the panels. Although fixed effects models may also be viable, they exclude variables that are static across the sample period (i.e. U.S. firms), which makes them inappropriate for our analysis.

RESULTS

Table 2 includes the descriptive statistics and first-order correlations. While most correlations are moderate or low, *post-attack* has a correlation of 0.72 with *oil price*. To ensure that these correlations do not affect our analyses, we checked the Variable Inflation Factor (VIF) which showed an average value of 1.30 and the maximum value of 2.15. These values are significantly below the threshold of 10. As a precaution, we repeated our analyses after excluding *oil price* and found the results to be completely identical.

Table 3 includes the test of our hypotheses. Model 1 only includes the baseline controls. It shows that higher sales and integrated operations both have a positive effect on alliance activity. Although *oil price* also appears to have a significant and negative effect, it goes away in the subsequent models. It appears to be an artifact of its correlation with *post-attack*. Model 2 tests for the first hypothesis by examining the *post-attack* implications on *alliance activity*. It shows the effect to be significant and negative ($\beta = -1.62$; $p < 0.001$), which supports hypothesis 1 that the global alliance activity experienced a significant decrease after the 9/11 attacks. Model

3 tests our argument that the decrease in alliance activity was relatively smaller for the U.S. firms. We test this by interacting the effect of *post-attack* and *U.S. firms*. This effect is positive and significant ($\beta = 1.40$; $p < 0.001$) which supports hypothesis 2 that the decrease in alliance activity was relatively smaller for the U.S. firms compared to the non-U.S. firms. It validates that firms that were proximate to the jolt exhibited greater willingness to take strategic risks in the face of attacks than firms that were farther away. In model 4, we test our argument regarding the effect of slack in diminishing the perceived intensity of attacks. We test this through a three-way interaction between *post-attack*, *U.S. firms*, and *debt/assets* as well as *current assets/current liabilities*. The result shows a significant and negative effect for *debt/assets* ($\beta = -0.04$; $p < 0.001$). Recall that higher debt/asset reflects lower levels of slack and therefore a negative and significant effect suggests that proximate firms with higher levels of slack experienced a significantly smaller decrease in alliance activity than firms with lower levels of slack. It validates that slack invigorates the responsiveness to perceived threats. However, the effect of *current assets/current liabilities* in the same model is insignificant, suggesting that in-hand liquid resources do not play a significant role. Thus, hypothesis 3 is partially supported.

- - - Insert Table 2 about here - - -

In the final model, we test our final hypothesis (hypothesis 4) regarding the geographical localization of alliance activity subsequent to the attack. We test this through a three-way interaction between *post-attack*, *U.S. firms*, and *geographical confinement*. The positive and significant effect ($\beta = 3.75$; $p < 0.001$) shows that there was a greater increase in the geographical confinement of alliance activity after the attack by U.S. firms when compared to non-U.S. firms, validating that higher perception of threats led to excessive filtering of partners by the more proximate firms. It identifies that alliance activity subsequent to the 9/11 attacks led

to greater geographical partitioning and therefore a larger partnering distance between the U.S. and the non-U.S. firms. The fully saturated model (model 5) shows an R-sq (within) of 0.17. Although R-sq values are not particularly meaningful in the case of random effects models, the significant increase in R-sq from 0.01% in the baseline model suggests that the hypothesized effects offer a substantive increase in our ability to explain the variation in alliance activity.

- - - Insert Table 3 about here - - -

DISCUSSION AND CONCLUSION

Our study set out to examine whether a firms' proximity to a jolt increased their responsiveness to threats. We argued that in the context of the 9/11 attacks the evidence suggests that the reaction in the U.S. was significantly more positive compared to that in non-U.S. environments. We argued that this difference is a consequence of the subjective nature of risk assessments. Firms that are closer to the attack are likely to perceive a stronger threat compared to those that are farther from it. This leads to a more aggressive reaction in terms of strategic choices that can diminish the implications of the attack. In particular, we argued that while the frequency of strategic alliances will decrease in the aftermath of the attack, this decrease would be significantly smaller for firms that are more proximate to the attack. This diminished perception of threat would be stronger for firms that possess higher levels of slack, and it will lead to a greater geographical confinement of the alliance activity by the proximate firms. We found that there was a significant decrease in alliance activity after the 9/11 attacks and this decrease was significantly smaller for the U.S. firms. Although the U.S. firms with higher slack in the form of lower debt levels experienced a smaller decrease in alliance activity, we found that liquid cash resources did not play a meaningful role in diminishing the perception of threats. Furthermore, our results show a significant increase in the geographical confinement of alliance

activity by the U.S. firms in the aftermath of the attacks. These results substantiate that the higher threat perception of the more proximate U.S. firms acted as an important stimulus towards the increase in the frequency of strategic alliances.

Although our primary lens has been subjective risk perceptions, our findings are consistent with transaction cost (TC) theory in terms of magnitude of alliances and the resource dependence theory (RDT) in terms of explaining the geographic confinement of alliances. TC suggests that alliances decrease organizational costs by eliminating the search and contractual costs associated with market-based mechanisms. Thus, strategic alliances can decrease the risk-exposure of allying firms. This explains the relatively higher alliance activity among US firms as a mechanism to mitigate the perceived disproportionate environmental threats. With respect to RDT, the prediction is that firms will reduce their exposure to external dependencies by entering into strategic alliances. Again, a non-U.S. firm allying with a U.S. based firm is likely to expose itself to newer sets of interdependencies that may come into play due to the latter's greater perceived likelihood of risk. Consequently, non-U.S. firms are better off limiting their alliance activity to partners that are less proximate to the jolt. Thus, consistent with our argument both TC and RDT suggest a relatively stronger alliance activity by the U.S. firms and a decrease in the frequency of alliances between U.S. and non-U.S. firms after the attack.

Overall, our findings suggest that rather than being a liability, proximity actually serves as a mechanism for organizational evolution. Previous research has shown that there were several beneficial outcomes when firms allied with proximate partners such as greater institutionalization of knowledge transfer activities (Santoro & Gopalakrishnan, 2000) and more communication and innovation (Stryker, Santoro, & Farris, 2012). Collaborating with proximate partners offers two specific kinds of advantages specifically during a crisis. First, proximate

firms from the same country have similar values and therefore there is lower perceived risk and therefore tend to be more optimal partners for building resilience and buffering from the emotional distress of a jolt. Second, previous research has demonstrated that firms manifest their lower risk-preference by entering into more non-equity alliances with proximate firms (domestic) as compared to foreign firms that are more distant where they enter into equity alliances (Scillitoe, Gopalakrishnan, & Santoro, 2015). This study further supports that finding since during a time of crisis firms demonstrate a greater propensity to geographically confine their alliance activity. Finally, our study shows that longer-term slack measures (debt/assets ratio) have a greater impact on alliance activity than short-term slack measures (current ratio). The formation and the fruition of alliance goals evolves over time and it is not surprising that short-term slack does not have as significant an effect on the extent of alliance activity.

Despite the contributions we offer to the literature, there are limitations to our study. First, although the data obtained here was quite comprehensive our study only includes publicly available secondary data of publicly held firms in the oil industry. Consequently, privately held firms in this sector that quite possibly had significant alliance activities with other privately held firms were not included in our sample frame. Moreover, while we believe our findings are generalizable to many other types of organizations and industrial sectors, our study context was focused on the oil industry which suggests that perhaps future studies could expand our work here by including both for-profit and non-profit organizations in a variety of industrial sectors. A second area for potential future study could focus on the path-dependent changes in firms' alliance tendencies based on the types of threats posed and the locations of those threats. This extension to our work here would require an examination that focused on the firm's overall alliance portfolio which was beyond the scope of our current investigation.

REFERENCES

- Bader, B., & Schuster, T. 2015. Expatriate social networks in terrorism-endangered countries: An empirical analysis in Afghanistan, India, Pakistan, and Saudi Arabia. *Journal of International Management*, 21(1): 63–77.
- Baum, J. A. ., Dobrev, S. D., & Witteloostuijn, A. van. 2006. *Ecology and strategy*. Emerald Group Publishing.
- Berkman, H., Jacobsen, B., & Lee, J. B. 2011. Time-varying rare disaster risk and stock returns. *Journal of Financial Economics*, 101(2): 313–332.
- Blanchard, E. B., Kuhn, E., Rowell, D. L., Hickling, E. J., Wittrock, D., Rogers, R. L., et al. 2004. Studies of the vicarious traumatization of college students by the September 11th attacks: effects of proximity, exposure and connectedness. *Behaviour Research and Therapy*, 42(2): 191–205.
- Blomberg, B., Hess, G., & Jackson, J. H. 2009. Terrorism and the returns to oil. *Economics & Politics*, 21(3): 409–432.
- Brounen, D., & Derwall, J. 2010. The Impact of Terrorist Attacks on International Stock Markets: The Impact of Terrorist Attacks on International Stock Markets. *European Financial Management*, 16(4): 585–598.
- Brück, T., & Wickström, B.-A. 2004. The economic consequences of terror: guest editors' introduction. *European Journal of Political Economy*, 20(2): 293–300.
- Chattopadhyay, P., Glick, W. H., & Huber, G. P. 2001. Organizational actions in response to threats and opportunities. *Academy of Management Journal*, 44(5): 937–955.
- Cheng, J. L. C., & Kesner, I. F. 1997. Organizational slack and response to environmental shifts: The impact of resource allocation patterns. *Journal of Management*, 23(1): 1–18.
- Chesney, M., Reshetar, G., & Karaman, M. 2011. The impact of terrorism on financial markets: An empirical study. *Journal of Banking & Finance*, 35(2): 253–267.
- Cyert, R. M., & March, J. G. 1963. *A behavioral theory of the firm*. Englewood Cliffs, NJ: Prentice-Hall Inc.
- Das, T. K., & Teng, B.-S. 2002. Alliance Constellations: A Social Exchange Perspective. *Academy of Management Review*, 27(3): 445–456.
- Denrell, J., & March, J. G. 2001. Adaptation as information restriction: The hot stove effect. *Organization Science*, 523–538.
- Doerfel, M. L., Lai, C.-H., & Chewing, L. V. 2010. The Evolutionary Role of Interorganizational Communication: Modeling Social Capital in Disaster Contexts. *Human Communication Research*, 36(2): 125–162.
- Drakos, K. 2004. Terrorism-induced structural shifts in financial risk: airline stocks in the aftermath of the September 11th terror attacks. *European Journal of Political Economy*, 20(2): 435–446.
- Dutton, J. E., & Jackson, S. E. 1987. Categorizing strategic issues: Links to organizational action. *Academy of Management Review*, 76–90.

- Eisendrath, D., Bernhard, B. J., Lucas, A. F., & Murphy, D. J. 2008. Fear and Managing in Las Vegas An Analysis of the Effects of September 11, 2001, on Las Vegas Strip Gaming Volume. *Cornell Hospitality Quarterly*, 49(2): 145–162.
- Fischhoff, B., Gonzalez, R. M., Small, D. A., & Lerner, J. S. 2003. Judged terror risk and proximity to the World Trade Center. *The Risks of Terrorism*: 39–53.
- Gittell, J. H., Cameron, K., Lim, S., & Rivas, V. 2006. Relationships, layoffs, and organizational resilience airline industry responses to September 11. *The Journal of Applied Behavioral Science*, 42(3): 300–329.
- Greve, H. R. 2011. Positional rigidity: Low performance and resource acquisition in large and small firms. *Strategic Management Journal*, 32(1): 103–114.
- Gulati, R., & Singh, H. 1998. The architecture of cooperation: Managing coordination costs and appropriation concerns in strategic alliances. *Administrative science quarterly*, 781–814.
- Hamel, G. 1991. Competition for competence and interpartner learning within international strategic alliances. *Strategic Management Journal*, 12(S1): 83–103.
- Hannan, M. T., & Freeman, J. 1984. Structural inertia and organizational change. *American Sociological Review*, 49(2): 149–164.
- Hasin, D. S., Keyes, K. M., Hatzenbuehler, M. L., Aharonovich, E. A., & Alderson, D. 2007. Alcohol consumption and posttraumatic stress after exposure to terrorism: effects of proximity, loss, and psychiatric history. *American Journal of Public Health*, 97(12): 2268–2275.
- Henisz, W. J., Dorobantu, S., & Narthey, L. J. 2013. Spinning gold: The financial returns to stakeholder engagement. *Strategic Management Journal*.
- Holman, E. A., Silver, R. C., Poulin, M., Andersen, J., Gil-Rivas, V., & McIntosh, D. N. 2008. Terrorism, acute stress, and cardiovascular health: A 3-year national study following the September 11th attacks. *Archives of General Psychiatry*, 65(1): 73–80.
- Iyer, D., & Miller, K. 2008. Performance feedback, slack, and the timing of acquisitions. *Academy of Management Journal*, 51(4): 808–822.
- James, K. 2011. Introduction to the special issue: Terrorism, disaster, and organizational science. *Journal of Organizational Behavior*, 32(7): 933–937.
- Johnston, R. B., & Nedelescu, O. M. 2006. The impact of terrorism on financial markets. *Journal of Financial Crime*, 13(1): 7–25.
- Jordan, A., & Audia, P. 2012. Self-enhancement and learning from performance feedback. *Academy of Management Review*, 37(2).
- Kacperczyk, A. 2009. With greater power comes greater responsibility? Takeover protection and corporate attention to stakeholders. *Strategic Management Journal*, 30(3): 261–285.
- Kahneman, D. 2010. *Thinking, fast and slow*. New York: Farrar, Straus and Giroux.
- Kahneman, D., & Tversky, A. 1979. Prospect theory: An analysis of decision under risk. *Econometrica: Journal of the Econometric Society*, 47(2): 263–291.

- Koka, B. R., & Prescott, J. E. 2002. Strategic alliances as social capital: A multidimensional view. *Strategic Management Journal*, 23(9): 795–816.
- Larobina, M., & Pate, R. 2009. The Impact of Terrorism on Business. *WCOB Faculty Publications*. http://digitalcommons.sacredheart.edu/wcob_fac/83.
- Lerner, J. S., Gonzalez, R. M., Small, D. A., & Fischhoff, B. 2003. Effects of Fear and Anger on Perceived Risks of Terrorism A National Field Experiment. *Psychological Science*, 14(2): 144–150.
- Levinthal, D. A., & March, J. G. 1993. The myopia of learning. *Strategic Management Journal*, 14(S2): 95–112.
- Lines, V. L. 2004. Corporate reputation in Asia: Looking beyond bottom-line performance. *Journal of Communication Management*, 8(3): 233–245.
- Li, S., & Tallman, S. 2011. MNC strategies, exogenous shocks, and performance outcomes. *Strategic Management Journal*, 32(10): 1119–1127.
- Li, S., Tallman, S. B., & Ferreira, M. P. 2005. Developing the eclectic paradigm as a model of global strategy: An application to the impact of the Sep. 11 terrorist attacks on MNE performance levels. *Journal of International Management*, 11(4): 479–496.
- Makinen, G. 2002. *Economic Effects Of 9/11: A Retrospective Assessment*. DIANE Publishing.
- Mandel, D. R. 2005. Are risk assessments of a terrorist attack coherent? *Journal of Experimental Psychology: Applied*, 11(4): 277.
- Marino, L. D., Lohrke, F. T., Hill, J. S., Weaver, K. M., & Tambunan, T. 2008. Environmental shocks and SME alliance formation intentions in an emerging economy: evidence from the Asian financial crisis in Indonesia. *Entrepreneurship Theory and Practice*, 32(1): 157–183.
- Marshall, R. D., Bryant, R. A., Amsel, L., Suh, E. J., Cook, J. M., & Neria, Y. 2007. The psychology of ongoing threat: Relative risk appraisal, the September 11 attacks, and terrorism-related fears. *American Psychologist*, 62(4): 304–316.
- Meyer, A. D. 1982. Adapting to environmental jolts. *Administrative science quarterly*, 515–537.
- Miller, K. D., & Bromiley, P. 1990. Strategic Risk and Corporate Performance: An Analysis of Alternative Risk Measures. *Academy of Management Journal*, 33(4): 756–779.
- Monge, P. R., Fulk, J., Kalman, M. E., Flanagan, A. J., Parnassa, C., & Rumsey, S. 1998. Production of Collective Action in Alliance-Based Interorganizational Communication and Information Systems. *Organization Science*, 9(3): 411–433.
- Muller, A., & Whiteman, G. 2009. Exploring the geography of corporate philanthropic disaster response: A study of Fortune Global 500 firms. *Journal of Business Ethics*, 84(4): 589–603.
- National Research Council. 2002. *Terrorism: Perspectives from the Behavioral and Social Sciences*. National Academies Press.
- Nikkinen, J., & Vähämaa, S. 2010. Terrorism and stock market sentiment. *Financial Review*, 45(2): 263–275.

- Ost, J., Granhag, P.-A., Udell, J., & Roos af Hjelmsäter, E. 2008. Familiarity breeds distortion: The effects of media exposure on false reports concerning media coverage of the terrorist attacks in London on 7 July 2005. *Memory*, 16(1): 76–85.
- Palmer, D., Friedland, R., & Singh, J. V. 1986. The Ties That Bind: Organizational and Class Bases of Stability in a Corporate Interlock Network. *American Sociological Review*, 51(6): 781–796.
- Pangarkar, N. 2007. Survival during a crisis: Alliances by Singapore firms. *British Journal of Management*, 18(3): 209–223.
- Park, N. K., & Mezas, J. M. 2005. Before and after the technology sector crash: The effect of environmental munificence on stock market response to alliances of e-commerce firms. *Strategic Management Journal*, 26(11): 987.
- Reeb, D., Sakakibara, M., & Mahmood, I. P. 2012. From the Editors: Endogeneity in international business research. *Journal of International Business Studies*, 43(3): 211–218.
- Ricart, J. E., Enright, M. J., Ghemawat, P., Hart, S. L., & Khanna, T. 2004. New frontiers in international strategy. *Journal of International Business Studies*, 35(3): 175–200.
- Rosenkopf, L., & Almeida, P. 2003. Overcoming local search through alliances and mobility. *Management Science*, 49(6): 751–766.
- Rosner, M. M. 1968. Economic Determinants of Organizational Innovation. *Administrative Science Quarterly*, 12(4): 614–625.
- Rothaermel, F. T., & Deeds, D. L. 2004. Exploration and exploitation alliances in biotechnology: A system of new product development. *Strategic Management Journal*, 25(3): 201–221.
- Russo, M. V. 2001. Institutions, exchange relations, and the emergence of new fields: Regulatory policies and independent power production in America, 1978–1992. *Administrative Science Quarterly*, 46(1): 57–86.
- Sacco, K., Galletto, V., & Blanzieri, E. 2003. How has the 9/11 terrorist attack influenced decision making? *Applied Cognitive Psychology*, 17(9): 1113–1127.
- Santoro, M. D. 2000. Success breeds success: The linkage between relationship intensity and tangible outcomes in industry–university collaborative ventures. *The Journal of High Technology Management Research*, 11(2): 255–273.
- Santoro, M. D., & Gopalakrishnan, S. 2000. The institutionalization of knowledge transfer activities within industry–university collaborative ventures. *Journal of Engineering and Technology Management*, 17(3): 299–319.
- Schilling, M. A. 2008. Understanding the alliance data. *Strategic Management Journal*, 30(3): 233–260.
- Schlenger, W. E., Caddell, J. M., Ebert, L., Jordan, B. K., Rourke, K. M., Wilson, D., et al. 2002. Psychological reactions to terrorist attacks: findings from the National Study of Americans' Reactions to September 11. *Jama*, 288(5): 581–588.

- Schuster, M. A., Stein, B. D., Jaycox, L. H., Collins, R. L., Marshall, G. N., Elliott, M. N., et al. 2001. A national survey of stress reactions after the September 11, 2001, terrorist attacks. *New England Journal of Medicine*, 345(20): 1507–1512.
- Scillitoe, J. L., Gopalakrishnan, S., & Santoro, M. D. 2015. The Impact of External Contexts on Alliance Governance in Biotech–Pharmaceutical Firm Alliances. *Organization Management Journal*, 12(3): 110–122.
- Silver, R. C., Holman, E. A., McIntosh, D. N., Poulin, M., & Gil-Rivas, V. 2002. Nationwide longitudinal study of psychological responses to September 11. *Jama*, 288(10): 1235–1244.
- Sine, W. D., & David, R. J. 2003. Environmental jolts, institutional change, and the creation of entrepreneurial opportunity in the US electric power industry. *Research Policy*, 32(2): 185–207.
- Sine, W. D., David, R. J., & Mitsuhashi, H. 2007. From plan to plant: Effects of certification on operational start-up in the emergent independent power sector. *Organization Science*, 18(4): 578–594.
- Singh, J. V. 1986. Performance, slack, and risk taking in organizational decision making. *Academy of Management Journal*, 29(3): 562–585.
- Stryker, J. B., Santoro, M. D., & Farris, G. F. 2012. Creating collaboration opportunity: designing the physical workplace to promote high-tech team communication. *Engineering Management, IEEE Transactions on*, 59(4): 609–620.
- Suder, G., & Czinkota, M. R. 2005. Towards an understanding of terrorism risk in the MNE. *Multinational Business Review*, 13(3): 3–23.
- Suvak, M., Maguen, S., Litz, B. T., Silver, R. C., & Holman, E. A. 2008. Indirect exposure to the September 11 terrorist attacks: does symptom structure resemble PTSD? *Journal of Traumatic Stress*, 21(1): 30–39.
- Thomas, J. B., Clark, S. M., & Gioia, D. A. 1993. Strategic Sensemaking and Organizational Performance: Linkages among Scanning, Interpretation, Action, and Outcomes. *The Academy of Management Journal*, 36(2): 239–270.
- Tilcsik, A., & Marquis, C. 2013. Punctuated generosity - How mega-events and natural disasters affect corporate philanthropy in US communities. *Administrative Science Quarterly*, 58(1): 111–148.
- United Nations, & Department of economic and social affairs. 2001. *Global economic slowdown aggravated by attacks on the United States*. Update to the Global Economic Outlook.
- Varadarajan, P. R., & Cunningham, M. H. 1995. Strategic alliances: a synthesis of conceptual foundations. *Journal of the Academy of Marketing Science*, 23(4): 282–296.
- Wan, W. P., & Yiu, D. W. 2009. From Crisis to Opportunity: Environmental Jolt, Corporate Acquisitions, and Firm Performance. *Strategic Management Journal*, 30(7): 791–801.

TABLE 1.
Mean difference in Alliance Activity before and after the 9/11 attacks

Sample Characteristics	Pre-attack	Post-attack	t-value
All firms	2.29	0.67	7.48***
U.S. firms	0.96	0.53	2.09*
Non-U.S. firms	2.72	0.70	7.55***

* $p < 0.05$; *** $p < 0.001$

TABLE 2.
Descriptive Statistics and Correlations

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10
1 Alliance activity	1.15	4.57										
2 Post-attack	0.71	0.46	-0.16									
3 U.S. firms	0.19	0.40	-0.05	-0.08								
4 Debt/assets	26.84	69.20	-0.04	-0.03	0.10							
5 Current assets/current liabilities	1.47	8.82	-0.02	0.04	0.01	-0.04						
6 Geographical confinement	0.20	0.40	0.45	-0.09	-0.01	-0.03	-0.04					
7 Sales (Ln)	9.12	3.51	0.15	0.06	-0.10	-0.12	-0.18	0.26				
8 Capital intensity/1000	0.02	0.47	0.01	-0.01	0.01	0.01	-0.01	0.01	0.08			
9 R&D intensity	0.00	0.07	0.00	-0.01	0.06	0.01	0.03	-0.01	-0.07	0.00		
10 Integrated firm	0.38	0.48	0.17	-0.01	0.02	0.01	0.00	0.28	0.18	0.02	-0.01	
11 Oil price	55.33	30.99	-0.11	0.72	-0.06	-0.02	0.02	-0.05	0.07	-0.01	-0.02	0.01

N = 2089; Correlations $\geq |0.06|$ are significant at $p \leq 0.01$

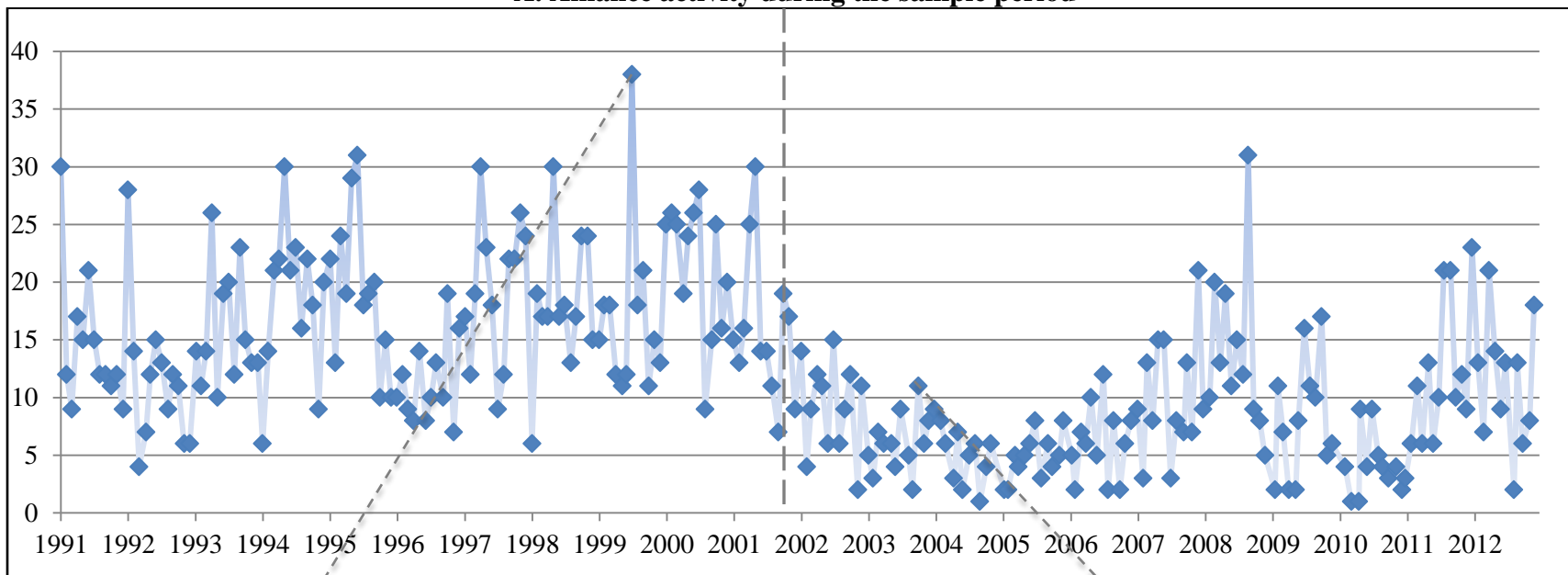
TABLE 3.
GLS Random Effects Regression Models for Alliance Activity

Variables	1	2	3	4	5	6
Post-attack		-1.62***	-1.92***	-2.79***	-3.06***	-1.66***
Post-attack x U.S. firms			1.40***	2.25***	2.84***	1.82**
Post-attack x U.S. firms x Debt/assets				-0.04***	-0.04***	-0.05***
Post-attack x U.S. firms x Current asset/current liabilities					-0.68	-0.49
Post-attack x U.S. firms x Geographical confinement						3.75***
U.S. firms			-1.53*	-2.35***	-2.94***	-2.09**
Debt/assets				-0.04***	-0.04***	-0.05***
Post-attack x Debt/assets				0.04***	0.04***	0.05***
U.S. firms x Debt/assets				0.04***	0.04***	0.05***
Current asset/current liabilities					-0.15*	-0.10
Post-attack x Current asset/current liabilities					0.16*	0.10
U.S. firms x Current asset/current liabilities					0.68	0.49
Geographical confinement						5.85***
Post-attack x Geographical confinement						-5.53***
U.S. firms x Geographical confinement						-2.54***
Sales (Ln)	0.08+	0.11*	0.10*	0.11*	0.11*	0.11**
Capital intensity (/1000)	-0.005	-0.005	-0.005	-0.002	-0.002	-0.002
R&D intensity	0.16	0.28	0.16	0.15	0.14	0.12
Integrated firm	1.04*	0.98*	1.01*	0.99*	0.98*	0.64+
Oil price	-0.01***	0.004	0.004	0.004	0.004	0.003
Wald Chi ²	28.40***	86.46***	101.19***	118.39***	124.51***	463.70***
R ² (within)	0.007	0.035	0.041	0.048	0.051	0.167
R ² (overall)	0.055	0.069	0.075	0.088	0.091	0.259

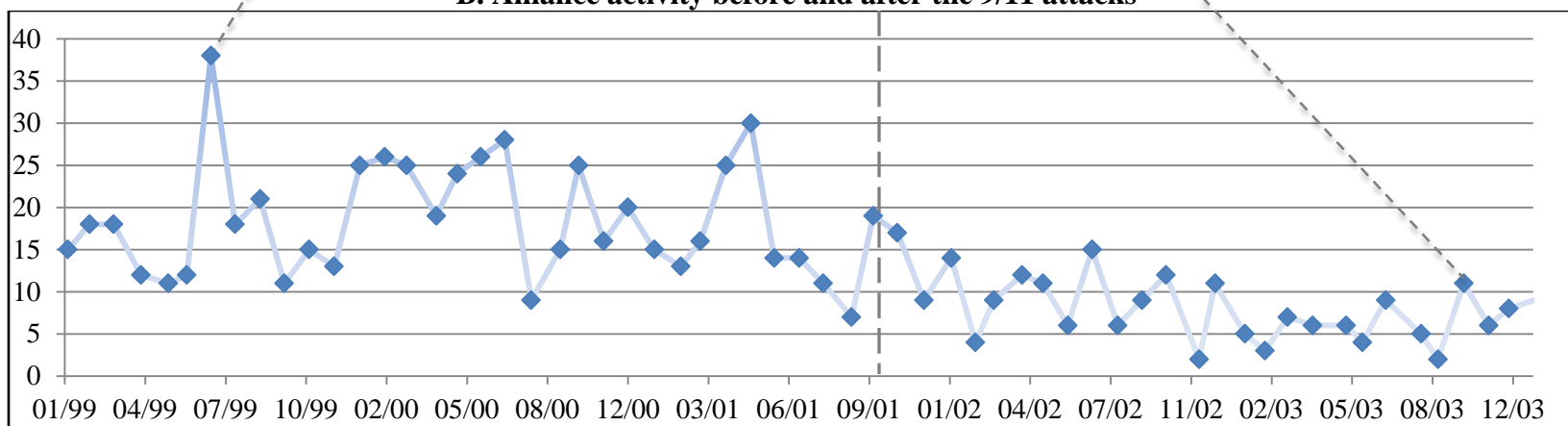
N = 2089; + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

FIGURE 1

A. Alliance activity during the sample period



B. Alliance activity before and after the 9/11 attacks



APPENDIX.
Corporate headquarters of the sampled firms

Country	Sampled Firms
Australia	1
Austria	1
Brazil	2
Canada	4
China	5
France	1
Germany	39
Greece	2
Hong Kong	4
India	11
Indonesia	2
Israel	3
Japan	6
Malaysia	3
Netherlands	1
Nigeria	10
Norway	1
Philippines	2
Russia	19
Saudi Arabia	2
Singapore	1
South Korea	5
Taiwan	1
Thailand	5
Turkey	1
UAE	1
UK	10
USA	31
Total	174