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Disaster immunity and performance of service firms: The influence of market acuity and supply network partnering

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ABSTRACT

In this paper we explore how a firm can develop disaster immunity—the capability to manage disaster-through the exploitation of market acuity and supply network partnerships. We use the hierarchy of capabilities framework and a social capital lens to view partnerships wherein a service supply network member's market acuity can create and leverage operational partnership (fluid partnering), and strategic partnership (relational partnering) to enhance disaster immunity. Results of our empirical analysis indicate that the influence of market acuity on the level of disaster immunity is mediated by supply network partnering and innovation. Moreover, our results confirm that building disaster immunity can have a significant positive influence on the performance of service firms.

1. Introduction

Disasters can have significant consequences for organizations in supply networks. The 2011 Japan earthquake and the resulting Tsunami "knocked out factories supplying everything from high-tech components to steel, forcing firms including Toyota Corp (7203.T) and Sony Corp (6758.T) to suspend production" (Kim and Jim, 2011). The twin disasters in 2011, the Japan earthquake and massive flooding in Thailand, adversely affected the supply of auto parts to Toyota leading to a reduction in output by 400,000 units (Armstrong, 2012). Consequently, net profit for Toyota declined by about 30%. These examples illustrate the importance of developing the capability to manage disasters—that is, the need to build disaster immunity (Ojha, 2008).

Disaster immunity allows a firm to serve its customer by increasing the reliability of a firm's operations (Clas, 2008). Prior research has explored ways to managing disaster. Issues addressed in the literature include using TQM prescriptions to manage disasters (Lee and Wolfe, 2003); improving relationship between public and private interests and increasing system redundancy (Sheffi, 2002); using a disaster management plan (Helferich and Cook, 2002); choosing safe locations (Hale and Moberg, 2005); using the right portfolio of suppliers (Trkman and McCormack, 2009); carrying buffer inventories (Song and Zipkin, 1996); diversifying suppliers (Tomlin and Wang, 2005; Dada et al., 2007); improving customer–supplier relations (Krause, 1997; Handfield et al., 2000; Liker and Choi, 2004; Krause et al., 2007); using alternate or standby suppliers (Tomlin, 2006, 2009; Chopra et al., 2007); and demand shift/management (Tomlin, 2009).

We add to the prior literature on disaster immunity by adopting a social capital lens to view how partnerships may be leveraged effectively in a service supply network. Social capital is defined as "the ability of actors to secure benefits by virtue of membership in social networks" (Portes, 1998:6). Similarly, social capital is also viewed in terms of the information benefits that accrue from strategic alliances (Koka and Prescott, 2002). It has been suggested that social capital plays a key role in enabling dynamic capability, and that social capital is critical for rent generation (Blyler and Coff, 2003). In the supply chain management literature as well, scholars have begun to devote attention to the effect of social capital on performance (Krause et al., 2007; Lawson et al., 2008). Our interpretation of social capital as being composed of network relationships is consistent with prior treatment of the construct (Nahapiet and Ghoshal, 1998).

Researchers have also noted that a firm can use social capital to achieve its performance goals (Dyer, 1996). The argument has been that social capital helps improve firm performance by providing novel information and by enabling innovation (Granovetter, 1985). In the context of a supply network, social capital is embodied in a firm's supply network partnering. Social relationships tend to create reciprocal obligations that could lead to mutually beneficial outcomes in the innovation arena. Firms engage in alliances to seek resource complementarities and deliver superior value in the form of innovative products and services. Social capital provides

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the basis for the generation of other competitive advantages. For example, network relationships were found to positively impact performance (Chen and Paulraj, 2004a, 2004b) as well as innovation (Teece, 1988; Imai et al., 1985).

There has been increasing interest in exploring the influence of supply network partnering in the context of risk management in supply networks (Trkman and McCormack, 2009). However, its ability to mitigate disasters has not been fully explored, and a theoretically anchored investigation of its influence on disaster immunity is lacking. Hence, one of the objectives of this study is to explore how a firm can use supply network partnering to develop disaster immunity capability.

The supply network literature suggests that market acuity is an important component of the intellectual capital of the firm (Rosenzweig and Roth, 2007). Market acuity represents the knowledge of a firm about its competitive environment. The importance of market acuity is contingent on the speed of changes and dynamism (environmental uncertainty) surrounding the firm's micro environment (Froehle et al., 2000). Disasters and accompanying disruptions provide highly uncertain environments that require substantial need for responsiveness enabled by rapid adaptations to changing environment. Building on work by Nahapiet and Ghoshal (1998) and others, Tomlin (2006) posited that market acuity may affect the disaster immunity capability of a firm. However, it is not quite clear exactly how this occurs. Also, the directionality of the influence is not clear. The traditional framework for social capital, when applied to the supply network context, would suggest that supply network partnering (the social capital element) helps the firm accumulate market acuity (the intellectual capital element). However, Nahapiet and Ghoshal (1998): 259 provide an intriguing alternate explanation. They state that "although our primary aim has been to suggest that social capital influences the development of intellectual capital, we recognize that the pattern of influence may be in the other direction." In the context of supply networks, this suggests that market acuity may, in fact, be an antecedent that helps build supply network partnerships. We seek to explore Nahapiet and Ghoshal's contention in the context of a service network. Thus, an important objective of this study is to investigate the possibility of market acuity as an antecedent to supply network partnering, and the influence of the ensuing supply network partnering on the firm's disaster immunity.

An important implication of past research on supply network partnering is that it would be incorrect to assume that *all* partnerships are strategic in nature (Mahapatra et al., 2010). Supply network partnering has been viewed on a continuum that ranges in increasing relational intensity from operational to strategic (Mentzer et al., 2000). Others have conceptualized two types of supply network partnering—fluid partnering and relational partnering. Fluid partnering, which plays an operational role, allows a firm to alter its existing network to gain access to the most useful resources available in the existing environment (Duysters and de Man, 2003). Relational partnering, on the other hand, has a strategic role as it allows a firm to apply concerted effort to make improvements to its current way of providing services through exploitative innovation (Levin and Cross, 2004). It should be noted that in this view a firm can engage in one or both types of partnering with different members of the supply network. For example, a business may have a strategic partnership with A and B partners, and an operational partnership with C, D, and E firms. Thus social capital can exist simultaneously in two different forms of partnering. However, there is very limited research on how these two forms of partnering affect a firm's ability to build disaster immunity. Hence, yet another key objective of this study is to investigate whether fluid and relational partnering influence a firm's disaster immunity differently.

Finally, extant literature suggests that two key constructs worth exploring in the context of disaster immunity and firm performance are market acuity and supply network partnering. As noted earlier, there is some research that addresses relationships among these four constructs of interest. However, prior research is fragmented and most of this work has focused on bi-variate relationships. A comprehensive framework that includes all four constructs has yet to be developed and tested. Hence, the overarching objective of this study is to develop and test a unifying framework that is inclusive of all four constructs. In summary, research that links market acuity and supply-chain partnering to disaster immunity and firm performance, is fragmented. We have highlighted several gaps in the literature. Stated formally, the four research questions that we will investigate in this study are

1. What does a unifying framework that includes market acuity, supply network partnering, disaster immunity and firm performance look like?
2. Does supply-network partnering influence a firm's disaster immunity?
3. What is the relationship between market acuity and disaster immunity of a firm?
4. Do different types of supply-chain partnering (e.g., "relational" and "fluid" partnering) influence a firm's disaster immunity differently?

We investigate these four research questions in this study. We begin with research question 1 by building on extant literature and offering an overarching theoretical framework that incorporates the four constructs of interest. Next, we provide theoretical arguments that lead into the nine hypotheses related to research questions 2, 3 and 4. Then, we outline the methodology and analysis and empirically test our hypotheses. Finally, we conclude with discussion and implications of our study.

2. Conceptual framework development

2.1. Theoretical underpinnings—the hierarchy of capabilities

We begin by addressing research question-1: What does a unifying framework that includes market acuity, supply network partnering, disaster immunity and firm performance look like? Our fundamental premise is that a firm can be viewed as a bundle of capabilities (Nelson and Winter, 1973; Helfat, 2003; Jacobites and Winter, 2012). When firms exercise their capabilities, it generates outcomes that affect performance measures. We first note that three constructs in our study (market acuity, supply network partnering, and disaster immunity) are, by definition, organizational capabilities. To establish appropriate relationships between these three capabilities, we draw on work by Collis (1994) and Winter (2003) that uses a three-level "hierarchy of organizational capabilities" framework to characterize firm capabilities. We use the hierarchy framework to classify and link the three capabilities investigated in this study.

Capabilities that exist at the lowest level of the hierarchy are labeled zero-order capabilities. These represent the primary value-creating capabilities of the firm (Winter, 2003), and help a firm serve its customers. They are assumed to remain relatively unchanged until acted on by a higher level capability. The principle zero-order capabilities addressed in our research is disaster immunity. However, it should be noted that disasters, quite often, present unexpected problems that may not be resolved in routine ways. Thus, innovative solutions are required to manage the supply network and to address the disaster effectively. The ability to innovate allows the firm to provide the customers more