Journal of Operations Management 31 (2013) 52–61

Contents lists available at SciVerse ScienceDirect

Journal of Operations Management

journal homepage: www.elsevier.com/locate/jom

Learning from others' misfortune: Factors influencing knowledge acquisition to reduce operational risk

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ARTICLE INFO

Article history:
Available online 28 June 2012

Keywords:
Operational risk
Learning
Knowledge acquisition
Behavioral operations
Vignette-based field experiment

ABSTRACT

Risks arising from operations are increasingly being highlighted by managers, customers, and the popular press, particularly related to large-scale (and usually low-frequency) losses. If poorly managed, the resulting disruptions in customer service and environmental problems incur enormous recovery costs, prompt large legal liabilities, and damage customer goodwill and brand equity. Yet, despite conventional wisdom that firms should improve their own operations by observing problems that occur in others' processes, significant operational risks appear to be ignored and similar losses recur. Using a randomized vignette-based field experiment, we tested the influence of organization-level factors on knowledge acquisition. Two organization-level factors, namely perceived operational similarity, and to a lesser extent, market leadership, significantly influenced the risk manager's likelihood of acquiring knowledge about possible causes that triggered another firm's operational loss. These findings suggest that senior managers need to develop organizational systems and training to expand the screening by risk managers to enhance knowledge acquisition. Moreover, industry and trade organizations may have a role in fostering the transfer of knowledge and potential learning from operational losses of firms.

1. Introduction

Identifying and mitigating risks arising from operations and supply chains are increasingly being highlighted (Sodhi et al., 2012) as having important implications for consumer safety and operational competitiveness (Lewis, 2003; Marucheck and Greis, 2011). When poorly managed, the disruptions (Hendricks and Singhal, 2005) and environmental harm (Kleindorfer and Saad, 2005) resulting from operational losses impose enormous recovery costs, reduce customer goodwill and brand equity, and attract expensive litigation (Lewis, 2003; Muermann and Oktem, 2002). Moreover, there are often spillover effects, with the problems of one firm causing a loss of revenue and increased regulation across the industry, whether it be from an oil spill, reports of food contamination, or recall of defective products (Lewis, 2003; Salin and Hooker, 2001).

Thus, when disaster befalls one firm, it is only rational that first, others should take notice; and second, managers should undertake improvements in their own operations to avoid a similar fate. For example, the CEO of British Petroleum (BP), acknowledged mistakes and a lack of preparedness that occurred with the oil spill of 2010 because it was viewed as a "low-probability event." He further added, "However, BP has learned a tremendous amount from the Gulf of Mexico disaster that can enhance safety in the future. . . The silver lining of the event is the significant and sustained advance in industry preparedness" (Herron, 2010). Yet, others noted that BP's recent oil spill was not an isolated event; other firms experienced similar, but smaller scale problems in years immediately leading up to this (Gold and Casselman, 2010). Thus, this purported learning should have taken place by BP before the spill occurred.

These observations raise at least two important tensions. First, learning by an *observing* firm from the operational losses at another *incident* firm affords an important proactive opportunity to reduce firm-specific operational risk, as well as improve industry-wide practice (Ingram and Baum, 1997; Kim and Miner, 2007). Historically, such learning has been rather limited (Cannon and Edmondson, 2005); initial research in behavioral operations management pointed toward potential shortcomings in how managers use information (Gino and Pisano, 2008). Moreover, observing firms can view such losses as idiosyncratic to the incident firm, have overconfidence in their own processes due to past success, and find it challenging to disentangle the cause–effect relationship underlying operational losses with limited information (Cannon and Edmondson, 2005; Denrell, 2003).

Second, risk managers – as organizational gatekeepers for risk-related knowledge and as facilitators for fostering process improvement – should broadly scan for operational losses of other

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http://dx.doi.org/10.1016/j.jom.2012.06.004

firms with an eye toward reviewing and reducing their own firm's operational risk. Given media coverage of any sizable spill or operational failure, search costs appear to be quite low relative to the financial losses of a major problem. However, to be fair, managers might be unclear as to where and how far such observational learning should extend.

Accordingly, the research objective of our paper is to empirically explore the importance of organization-level factors that foster or attenuate the likelihood that risk managers will acquire knowledge derived from an incident firm's significant operational problem. As the list of possible factors is lengthy, we focus on two factors derived from a synthesis of related research in managerial decision-making, organizational learning and operational risk. Both the market leadership of the incident firm, and operational similarity between the incident and observing firms are expected to shape the response of a risk manager at an observing firm.

This study makes three contributions to our understanding of risk management. First, we explore mechanisms that potentially explain how firms learn through observing misfortune or operational losses of others. This paper highlights two organization-level factors, namely market leadership and operational similarity, which influence risk managers within their role as organizational gatekeepers, and emphasizes how their behavior can be understood within basic heuristics. Second, by employing a randomized vignette-based field experiment, this paper empirically assesses the relative influence of these two factors in prompting managers to acquire knowledge from others' operational losses. This represents a critical initial step toward enabling senior managers, industry associations, and public policy experts to promote targeted action and engagement for risk-related learning between firms and within industries.

Finally, the expanding stream of research in operational risk to date has largely focused on the costs of disruption (Hendricks and Singhal, 2005), control of risk (Lewis, 2003), options to improve recovery (Yang et al., 2009), and the quantification of capital through improvising and building measurement (Alexander, 2003; Chapelle et al., 2008). As an extension, this paper examines managerial perceptions that drive information-gathering behavior related to process improvement (Gino and Pisano, 2008) and risk reduction (Muermann and Oktem, 2002).

The next section describes the literature on operational losses and hypothesizes organization-level factors that influence knowledge acquisition by a firm. Section 3 describes the research settings, data, and experiment, and Section 4 presents the findings. Finally, Section 5 discusses the managerial implications and Section 6 suggests avenues for future research.

2. Literature review and hypotheses development

2.1. Operational risk and process improvement

Managing and mitigating risk have received much attention in the accounting and financial fields, some of which is now transferring to operations management under the label operational risk (Seshadri and Subrahmanyam, 2005; Sodhi et al., 2012). At a simple level, risk can be characterized in at least three ways: value at risk (e.g., downside portfolio risk); variance from an expected outcome (e.g., financial risk-return models); and expected loss from a negative event (e.g., catastrophe). For example, in the supply chain literature, variance has been captured in research into supply–demand coordination risks as detailed in Kleindorfer and Saad (2005) and negative events in disruptions to supply chains (Hendricks and Singhal, 2005). This third characterization, namely the expected loss from a large-scale operational problem, is particularly challenging to anticipate, mitigate and manage effectively.

In principle, operational risk encompasses all potential losses emanating from operational inputs, internal processes and systems (including employees and equipment), downstream supply chain partners or customers, and external events (Alexander, 2003). Studies in operations management tend to emphasize high-frequency, relatively low-impact operational losses. For example, identifying and reducing routine recurring losses remains a foundational principle of quality management; and well-established tools such as statistical process control (SPC) can be used to reduce losses. Moreover, categorizing the sources of variation into common or special causes provides an empirical basis for identifying when action is necessary to reduce the variation, and hence, risk. Because these losses initially are relatively frequent and of relatively small scale, they provide a basis for learning-by-doing or experiential learning. Learning curve theory provides one explanation for how increased experience either reduces unit cost of production or repeated exposure to small losses decreases subsequent losses (Pisano et al., 2001; Sitkin, 1992). For example, Darr et al. (1995) showed that knowledge acquisition by a firm is significantly associated with decreasing unit cost of production. Similarly, Lapré and Tsikriktsis (2006) found that as airlines increase their operating experience, i.e., cumulative number of flights, they can reduce customer dissatisfaction. More recently, Madsen and Desai (2010) suggested that firms learn not only from their operating experience but also from their own failure experience. Collectively, these studies suggested that investment in continuous improvement that reduces variation can decrease the likelihood or magnitude of a negative outcome (Tucker, 2004), for example, through a post hoc review of failure events (Ellis et al., 2006).

In contrast to learning from high-frequency low-impact operational losses, improvement and learning from low-frequency high-impact operational losses is inherently different. First, the infrequent occurrence limits opportunities for experiential learning. Therefore, probability-based tools such as SPC cannot effectively serve as an input to process improvement. Second, the large negative impact of such losses suggests that learning should not only result from experiential learning, but also gained by avoiding the losses incurred by others. In other words, learning is possible either through critical internal analysis and improvement, or by proactively leveraging knowledge acquired from outside the firm, such as observing the misfortune of others.

2.2. Knowledge acquisition by an observing firm

Observational learning has been studied in various disciplines and has taken several terms, including "vicarious learning", "learning by outcomes of others", "learning by spillovers" and "population-level" learning (Bandura, 1977; Bikhchandani et al., 1998; Huber, 1991; Miner and Anderson, 1999). Rather than provide an exhaustive review of this complex set of literatures, the intent here is to highlight factors that could enable observational learning to occur. Generally, for observational learning, managers must scan the environment to identify options and then apply any insights to increase the firm's likelihood of success or lower the probability of operational losses. So, to learn from others' successes, firms observe effective outcomes and seek to understand and replicate the underlying processes, routines, and strategies (Conell and Cohn, 1995). In essence, the routines and processes of a successful firm also can represent a benchmark or aspirational model.

In contrast, for operational losses, observational learning involves avoidance or anticipation of triggers initiating such losses. For example, after examining historical levels of failures, Ingram and Baum (1997) reported that hotel chains reduce their failure rate as the aggregate operating experience increases across the industry. Similarly, Kim and Miner (2007) found empirical support for the importance of industry-specific applicability when they