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Operational risk assessments by supply chain professionals: Process and performance

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ABSTRACT

We consider the “process-performance paradox” in the assessment of operational risks by professionals in the field of operations and supply chain management (OSCM). The paradox states that although professionals with more expertise tend to decide in different ways, they often do not make better assessments than those with less expertise. We first replicate that this paradox exists in a context of the assessment of operational supply risks, and then show how the paradox can be understood as the consequence of process characteristics mediating the relation between expertise and assessment performance.

Using an experimental setup, we had 234 OSCM-professionals assess the operational risk in two series of different business cases, and measured several characteristics of their decision-making process. The strength of our approach lies in the fact that the business cases were real-life cases from our database of purchasing transactions in the area of IT-purchasing. This allows a comparison of the risk assessments of the professionals with the actual supply risk as was known from the survey database. Our findings show that, contrary to what is often assumed, the OSCM-professionals with more expertise do not use less information while assessing, nor are they faster. Instead, our results show that specialized expertise goes with increased certainty about the assessments, and general expertise goes with an increased use of intuitive judgment. However, the net effects of these expertise characteristics on assessment performance are zero. In the case of specialized expertise this is because specialized expertise is itself negatively related to performance. In the case of general expertise this is because the net effects of the use of intuition on performance are zero.

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1. Introduction

There are many reasons why careful management of the supply chain has become more important for contemporary firms. Demand is more volatile, competition is fiercer, and product life cycles have shortened, to name just a few. As Hendricks and Singhal (2005a: 36) have argued before, in response the emphasis in the management of supply chains is typically on lowering costs and increasing efficiency. This has led to a reliance on outsourcing and partnering, which in turn has led to a need for increased supply chain integration, growing interdependence, and increased complexity. The key insight is that this chain of events has caused supply chains to become more vulnerable to different kinds of risk. The number of different links in the chain is increasing, more of these links are occurring “further away” from the focal

firm, and the consequences of inaccurate risk assessments can be severe.¹

Management behavior as a response to risk is necessarily guided by subjective rather than completely objective assessments of these risks (Yates and Stone, 1992; Ellis et al., 2010; March and Shapira, 1987; Sitkin and Weingart, 1995; Zsidisin, 2003b). The mostly implicit assumption in the literature is that these risk assessments and perceptions are generally accurate and therefore the subsequent management behavior effective and efficient (Shapira, 1995; Hallikas et al., 2002; Zsidisin et al., 2004; Dekay et al., 2009; Ellis et al., 2010). However, there are good reasons to question this assumption (cf. Ghosh and Ray, 1997: 98). In several cases, serious errors in decision making such as the distortion of information and “bidirectional reasoning” have been observed (Brownstein, 2003; Dekay et al., 2009; Ghosh and Ray, 1997), not to mention the host of well-documented general

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¹ See: Blackhurst et al. (2005); Hendricks and Singhal (2005b); Neiger et al. (2009); Narasimhan and Talluri (2009); Braunscheidel and Suresh (2009); Ellis et al. (2010).

flaws in judgment and decision-making that all humans are prone to.²

Despite research emphasizing the importance of behavioral approaches to the assessment of supply risk, the process through which buyers approach these tasks has only recently been explored (Ellis et al., 2010; Bendoly et al., 2006). Many professionals rely on their experience and intuition and quote it as an important reason for their achievements (Agor, 1984, 1986; Klein, 2003; Mitchell et al., 2005; Snijders and Tazelaar, 2009; Hayashi, 2001). Especially in organizations that are embedded in turbulent environments, experience and the use of intuition are often seen as paramount (Khatri and Ng, 2000; Dane and Pratt, 2007), but their role and usefulness is ill understood. We contribute to this literature by analyzing the risk assessments of professionals in operations and supply chain management (OSCM) in a controlled experiment.

Our empirical approach is unique in the sense that we combine survey data with a directly linked experimental design. First, we executed a large-scale survey study among business managers on transactions between buyers and suppliers. The survey measured the whole purchasing process of a single transaction, starting from partner search and the selection procedure all the way up to the occurrence of problems and how they were solved. The survey questions asked for properties of the transaction and were based on established theoretical considerations.³ Then, we used the survey data to create (summarized) business cases that we presented in the experiment to a subset of the respondents of our survey. The strength of our multiple research method approach lies in the fact that the business cases we presented in the experiment are real, in the sense that they are reflecting actual business cases from our survey database, not just imaginary cases. This implies that we can compare the risk assessments of the participants in our experiments with the actual supply risk as is available from the field study. This kind of multiple method design is in line with suggestions by Hogarth (2005: 261) and Brunswik (1956) and, as far as we know, rare in the OSCM-field.

Our design implies that we consider the role of the OSCM-professional in the spirit of transaction cost theory and agency theory. In this approach, professionals are seen as the ones having to decide ex ante on whether and how much to invest in safeguarding a transaction. If necessary, they can for instance choose for more extensive search for a supplier, for the writing of more elaborate contracts, or for larger investments in negotiating. The strategic and operational supply risks we consider are the risks of having (different types of) problems with the supplier during and after the delivery. The sources of these supply risks may arise from individual supplier failures or from market factors (cf. Zsidisin, 2003a: 220), but also from a buyer's lack of monitoring or governance capabilities (David and Han, 2004; Rooks et al., 2006: 256, 2011: 445–447). The professional's subjective assessment of risk in this approach is assumed to be based on characteristics of the transaction, the supplier, the relation between buyer and supplier, the context in which the transaction takes place, and the characteristics of the buyer and the OSCM-professional in particular (cf. Williamson, 1999; Grover and Malhotra, 2003; Choi and Krause, 2006).

From the literature on behavioral decision-making it is a well-known fact that the empirical findings on the assessments of professionals often go counter to the general intuition. For many

assessments in a given profession, individuals with a moderate amount of training (novices) outperform laymen, but seasoned professionals do only just as well as novices (Camerer and Johnson, 1991). What is found in addition is often referred to as the “process-performance paradox”: although seasoned professionals do not outperform novices they do make their assessments in different ways. Stated otherwise, there is no relation between expertise on the one hand and assessment performance on the other, even though there is often a relation between expertise and the process characteristics of the assessment process.

We contribute to the literature on supply chain decision-making in two ways. First, we replicate that the process-performance paradox exists in a context of the assessment of operational risks, in line with previous research where we employed a similar mixed design on a different group of participants (cf. Tazelaar and Snijders, 2004). Second, and more importantly, we show how the process-performance paradox in OSCM risk assessment can be understood as the consequence of process characteristics mediating the relation between expertise and assessment performance.

The remainder of the paper is structured as follows. In Sections 2 and 3 we present the theoretical background and hypotheses on the relation between expertise, process characteristics, and assessment performance. In Section 4 we describe the design of the survey and the design of our experiment. In Section 5 we discuss our methodology, statistical analyses, and findings. In Section 6 we present our conclusions, together with a brief discussion on the weaknesses of the study and suggestions for future research.

2. Theoretical background and previous research on expertise

2.1. Evaluating professional expertise

The scientific literature on experts and expertise has long upheld a wide variety of definitions for the term “expert”. For a long time the primary criteria for identifying experts were perceived accumulated accessible knowledge, and length of experience in a domain, as well as social reputation (Chi et al., 1988; Hoffman, 1992). Next to these criteria, a large number of other mostly ascribed personal and cognitive characteristics have been suggested as indicative of expertise, such as knowing what is relevant, having the ability to simplify, decisiveness, flexibility, stress tolerance, self-confidence, and a methodical approach to problem-solving (Shanteau, 1987, 1988; Abdolmohammadi and Shanteau, 1992). It remains unclear whether a professional with such characteristics makes assessments that are better (Andersson, 2004a).

A more recent stream of literature has therefore argued instead that the focus should be on individuals who exhibit superior performance on representative, objective tasks in their field (Ericsson and Smith, 1991; Ericsson et al., 2007a,b; Snijders and Tazelaar, 2009). For many fields of expertise, including operations and supply chain management, there are few ready-made objective test criteria that can be used in field studies. One reason is that in practice the experts are often the only ones who are asked. In other cases, the environment within which the expert operates makes it difficult to evaluate the net benefit of the behavior of the expert because many other factors also influence the eventual outcome.

This lack of objective criteria has had at least two important consequences for present-day research into experts and expertise. The first consequence is that studies have emerged that consider other performance criteria than being able to make accurate predictions, such as studies on consistency within and consensus between experts, or self-confidence (Shanteau et al., 2002; Malhotra et al., 2007; Weiss et al., 2009). A second consequence is that research on expertise has targeted fields where external criteria are more

² For an overview, see Tversky and Kahneman (1974); Dawes (1974); Kahneman et al. (1982); Slovic et al. (1982); Gilovich (1991); Gilovich et al. (2002); Camerer and Loewenstein (2004).

³ These considerations range from transaction cost theory (Coase, 1937; Williamson, 1985), resource dependency perspectives on organizational capabilities (Kogut and Zander, 1992; Argyres, 1996), and theories regarding the social embeddedness of economic behavior (Granovetter, 1985), to sociological models based on trust and social exchange (Coleman, 1990; Raub and Weesie, 1990).

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