



The contingency effects of environmental uncertainty on the relationship between supply chain integration and operational performance

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ABSTRACT

This paper extends prior supply chain research by building and empirically testing a theoretical model of the contingency effects of environmental uncertainty (EU) on the relationships between three dimensions of supply chain integration and four dimensions of operational performance. Based on the contingency and organizational information processing theories, we argue that under a high EU, the associations between supplier/customer integration, and delivery and flexibility performance, and those between internal integration, and product quality and production cost, will be strengthened. These theoretical propositions are largely confirmed by multi-group and structural path analyses of survey responses collected from 151 of Thailand's automotive manufacturing plants. This paper contributes to operations management contingency research and provides theory-driven and empirically proven explanations for managers to differentiate the effects of internal and external integration efforts under different environmental conditions.

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1. Introduction

Growing evidence suggests that supply chain integration (SCI) has a positive impact on operational performance outcomes, such as delivery, quality, flexibility and cost (Rosenzweig et al., 2003; Dröge et al., 2004; Devaraj et al., 2007; Swink et al., 2007; Flynn et al., 2010). Sousa and Voss (2008) suggested that when the value of a best practice, such as SCI, is supported by empirical evidence, research should shift from the justification of its value to the understanding of the contextual conditions under which it is effective. Among other factors, environmental uncertainty (EU) has been identified as a contextual factor which may affect the effectiveness of a best practice (Thompson, 1967; Venkatraman, 1989; Souder et al., 1998).

Some recent studies argue that SCI–performance relationships are moderated by EU (O'Leary-Kelly and Flores, 2002; Fynes et al., 2004; Koufteros et al., 2005). However, these studies are problematic in three areas. First, the use of different approaches in conceptualizing SCI, performance and EU constructs disallows a meaningful comparison of, or conclusion about, the contingency

effects of EU. Second, the evidence reported so far indicates that SCI–performance relationships are not always moderated by EU (Fynes et al., 2004; Koufteros et al., 2005), and even if moderating effects exist, their direction varies (O'Leary-Kelly and Flores, 2002). For example, Koufteros et al. (2005) found insignificant moderating effects of EU on the relationships between supplier/customer integration and quality/product innovation. O'Leary-Kelly and Flores (2002) found positive relationships between marketing/sales planning decision integration and firm performance under a high, but not a low EU. However, their results surprisingly indicated that the relationships between manufacturing planning decision integration and firm performance are positive under a low, instead of a high EU. Anchored in the premise that EU creates the need for SCI, some studies argue that SCI–performance relationships will become significant or stronger under a high EU. Such a “theory” cannot explain the above mixed findings. The lack of a theoretical explanation is the third, and perhaps the most pressing issue that deserves more research attention.

This paper builds and empirically tests a theoretical model to explain the contingency effects of EU on the salient operational performance outcomes of SCI. This paper differs from others in a number of aspects. We conceptualize both SCI and operational performance as multidimensional constructs, instead of the unidimensional approach applied by others (e.g., Stank et al., 1999; Rosenzweig et al., 2003). We have collapsed SCI into three dimensions – internal, supplier, and customer integration – to enable the examination of the performance impacts of different SCI dimen-

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