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Aligning supply chain strategy with corporate environmental strategy: A contingency approach

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ABSTRACT

Environmental sustainability is driving firms to extend their green effort across their supply chain. However, the literature has not thoroughly examined the multiple relationships among supply chain (SC) strategy, corporate environmental (CE) strategy, and firm performance. As such, this paper, adopts an alignment perspective to empirically examine the complex links between four SC strategies and four CE strategies on 172 manufacturing firms in Taiwan. Using profile deviation analysis, it is found that overall an SC strategy when properly aligned with a CE strategy leads to improved firm performance. Specifically, a risk-hedging SC strategy should be aligned with a defensive CE strategy to yield improved firm performance. Likewise, a responsive SC strategy should be aligned with an accommodative CE strategy, and an agile SC strategy with a proactive CE strategy.

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1. Introduction

Environmental sustainability drives firms to not only develop corporate environmental proactivity but also to move toward green/sustainable supply chain management (Aragon-Correa and Rubio-López, 2007; Seuring and Müller, 2008). Already, firms have adopted environmental friendly practices such as environmental purchasing (Green et al., 1996), green supply (Bowen et al., 2001), green supply chain management (GSCM) (Zhu and Sarkis, 2004), and sustainable logistics strategies (Kumar and Putnam, 2008).

Research (Carter and Rogers, 2008; Molina-Azorín et al., 2009) suggests that proactive green initiatives yield competitiveness, economic benefits, better corporate social responsibility, and sustainability. However, the implementation of environmental management involves numerous actors in the supply chain, which may lead to managerial challenges related to broader organizational complexities (Vachon and Klassen, 2008), high transaction costs, supply risk, and effective control over suppliers and implementation (Simpson and Power, 2005). These different outcomes could be due to the fact that sustainability broadens supply chain management to a wider and integrated perspective rather than a uni-dimensional and dichotomous view (Linton et al., 2007; Seuring and Müller, 2008).

According to Linton et al. (2007), sustainability changes existing practices and creates new production and management systems. As such, it is difficult for firms to achieve a balance between the traditional efficiency based performance and environmental benefits, which in turn influences green management at the business and functional levels (Handfield et al., 2005; Mollenkopf et al., 2010). To mitigate the environmental risks arising from supply chain uncertainties and other issues, new analytical tools, performance metrics, and frameworks to are needed address the environmental issues in the supply chain (Fabbe-Costes et al., 2011; Handfield et al., 2005; Simpson and Power, 2005). However reengineering the supply chain under such a complex and uncertain context is a challenge. Bielak et al. (2007), in a survey of 391 CEOs, report that competing strategic priorities and the lack of recognition from financial markets are the main impediments when implementing integrated approaches to sustainability. They also indicate that it is difficult to manage a sustainable supply chain operating under different national regulations and social norms. Thus, two research questions arise: (1) what is the effective management of the multiple relationships between supply chain management and the environment, and (2) how does the deviation of the strategies from the ideal affect the overall firm performance.

Mollenkopf et al. (2010) urge that research should address how firms could implement green, lean, and global supply chain strategies concurrently to provide effective decision making across the supply chain. Further, Monczka and Petersen (2012) suggest that environmentally sustainable supply chain management is an integrated strategy which must align closely with and support

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business strategy in response to a changing marketplace. In the context of aligning goals for both efficiency and the environment, it is critical for firms to understand the unique needs of each strategy, and develop new capabilities to strategically integrate sustainability into the Supply Chain (SC) strategy and effectively manage the complex relations underlying these two strategies. Accordingly, this study adopts an alignment or fit perspective to examine the relationships between SC strategy and corporate environmental (CE) strategy, and the influence of the degree of alignment of these two strategies on performance enhancement.

Already, a significant amount of strategic alignment studies exists in the environmental management and green supply chain management literature. For instance, based on both moderation and mediation models, organizational factors and business circumstances are employed in discussing the environmental-performance linkage, e.g. industrial growth (Russo and Fouts, 1997), complementary assets (Christmann, 2000), business circumstances (González-Benito and González-Benito, 2005), and firm resources (López-Gamero et al., 2009). Further, research (e.g. Kocabasoglu et al., 2007; Wu et al., 2012; Zhu and Sarkis, 2004) has identified that factors such as production principles, willingness to take risk, and institutional pressures have moderating effects on green/reverse supply chain management. In contrast, some studies suggest that environmental practices have mediated impacts on green supply and manufacturing competitiveness (e.g. Bowen et al., 2001; Yang et al., 2010). Nevertheless, these studies mostly examine the relationships among the variables using the reductionist approach, which may not fully explain the interdependencies among the research constructs (Umanath, 2003). Besides, there is a dearth of research on the alignment effects of supply chain uncertainty and environmental strategy selection. Our paper borrows from the IS literature and adopts the profile deviation approach (Venkatraman, 1989). In this approach, alignment is conceptualized as the adherence to an external profile of an ideal type. In short, an ideal alignment scenario is deduced from theory and the deviations from this ideal state (usually measured empirically) are computed for further analysis.

This paper makes the following contributions. First, we adopt a novel methodological innovation as profile deviation analysis is relatively new to the environmental and supply chain field (Chen et al., 2011; Sun et al., 2009). Second, this study empirically examines the alignment impact of SC strategy and CE strategy on firm performance. Alignment in this study suggests that a firm's choice of a CE strategy fits its SC strategy. Greater alignment is viewed as a highly internal consistency of the activities that implement the numerous attributes of SC and CE strategies. From a managerial perspective, the alignment concept provides firms with a useful and systematic tool for considering SC and CE strategies simultaneously and then making holistic decisions within the firm and across the supply chain. Combined, an alignment of two distinct strategy streams under a profile deviation approach allows for effective decision making on environmental resource allocation in a supply chain context. This is unique to the field and is consistent with the multi-dimensional and holistic perspective of sustainable supply chain management. Thus, a high degree of adherence to the ideal profiles of SC and CE strategies improves firm performance. The third contribution is to provide a research agenda that systematically addresses SC and CE strategies to explain the possible benefits on performance. In doing so, this paper contributes to the literature by providing a unified theoretical lens to examine the complex network relationships and interactions of the different domains related to supply chain, sustainability, strategy, and performance. This will lend new insights into the theory and practice of SC and CE strategies.

The rest of the paper is organized as follows. Section 2 first provides the theoretical background on the alignment concept

and the ideal profiles of the SC and CE strategies, and then introduces the research model and hypotheses. Section 3 describes the research method, followed by a presentation of the results in Section 4. Section 5 provides a discussion of the findings, implications, and limitations and some directions for future research.

2. Theoretical background and hypotheses

We first discuss the alignment concept, the four ideal profiles for SC strategy, and the four ideal profiles for CE strategy, and then develop the research hypotheses.

2.1. Alignment concept

According to Nadler and Tushman (1980), alignment is the adjustment of one component in relation to another component so that the arrangement leads to an optimal consequence of the relationship between the components. Kaplan and Norton (2006) define strategic alignment as the internal consistency of the activities that implement the different attributes of strategy. The concept of alignment or fit is essential in a process of change in strategy formulation. As suggested by Miles and Snow (1984:12), "the process of achieving fit begins, conceptually at least, by aligning the company to its marketplace ... this process of alignment defines the company's strategy." Moreover, Venkatraman (1989) identifies six perspectives of alignment: moderation, mediation, matching, gestalt, profile deviation, and covariation. So far, only the moderation and mediation models are commonly used in the environmental and supply chain management research.

Though conceptualized in the context of strategy research, the alignment concept is also applicable to other disciplines. For instance, the environmental management literature provides the implications of the selection and interaction approaches in examining the relationship between environmental practices and performance (e.g. Christmann, 2000; González-Benito and González-Benito, 2005; López-Gamero et al., 2009). Also, there are some studies which address alignment under the mediated and moderated perspectives in the context of green/reverse supply chain management (Bowen et al., 2001; Kocabasoglu et al., 2007; Wu et al., 2012; Yang et al., 2010; Zhu and Sarkis, 2004). These papers however examine alignment from a bivariate rather than from a holistic perspective.

Alignment is the underlying conceptual theme for this study. Specifically, this study uses alignment under a profile deviation perspective to examine the links between the SC and CE strategies. Profile deviation is defined as the internal consistency of multiple contingencies (Drazin and Van de Ven, 1985). The higher the degree of adherence to an ideal multidimensional profile the better the performance. Deviations from this profile will result in negative performance (Venkatraman, 1989). Thus, the basic idea is that the SC and CE strategies should be aligned to enhance firm performance (e.g. Sabherwal and Chan, 2001). Following Lee (2002), this study applies four SC strategies types under two SC uncertainty attributes, and four CE strategies types under three environmental management attributes.

2.2. SC strategy ideal profiles

Given the concept of match between the type of product and the type of supply chain, Fisher (1997) categorizes supply chains as either efficient or responsive. Alternatively, lean and agile supply chains are used (e.g. Mason-Jones et al., 2000), with lean supply chains being physically efficient, and agile supply chains being responsive. Further, through the supply chain uncertainty

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