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How environmental collaboration with suppliers and customers influences firm performance: evidence from Dutch food and beverage processors

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ABSTRACT

Searching for sustainable growth opportunities, manufacturing firms are increasingly embedding sustainability concerns into their relationships with supply chain partners. In the present paper, we explore the potential of environmental collaboration with suppliers and customers to induce environmentally sustainable improvements to internal processes to address external sustainability pressures and to contribute to business performance. Grounded in resource based view spin-offs, this study claims that environmental collaboration can enhance the performance of the focal firm not only directly, but also indirectly – by stimulating the focal firm to implement more environmentally sustainable processes that in turn contribute to firm's performance. Providing manufacturing managers with a better understanding of the direct and indirect relationships between environmental collaboration and firm performance can gain them more control over the outcomes of environmental collaboration. Proposed relationships were tested in a sample of 139 Dutch food and beverage processors using structural equation modelling. The results indicate that environmental collaboration with suppliers can improve the performance of Dutch food and beverage processors directly as it induces cost savings. Nevertheless, such collaboration is not likely to assist firms seeking to improve environmental sustainability of their internal processes as one of the outcomes of environmental collaboration. On the contrary, environmental collaboration with customers induces performance indirectly, by stimulating food and beverage processors to implement sustainable process improvements that subsequently bring about cost savings and market gains.

1. Introduction

Urged by the current state of the natural environment, the dynamic evolution of stakeholders' requirements and changing methods to achieve environmental sustainability, manufacturing firms are continuously searching for practices and partnerships for sustainable growth. Embedding sustainability concerns in supply chain relationships is increasingly employed to reduce environmental impact of the product throughout its life cycle (i.e. FrieslandCampina (2012), Unilever (2012)). In environmental collaboration, supply chain partners leverage each other's resources and exploit learning and knowledge sharing opportunities to enhance environmental sustainability.

Prior research on environmental collaboration with supply chain partners focused on its determinants and performance implications (i.e. Diabat and Govindan (2011), Zhu et al. (2013)). However, quantitative research that investigates what changes in business processes and technologies are induced by environmental collaboration is scarce. Only Chiou et al. (2011) examined how environmental collaboration with suppliers induces improvements in environmental sustainability of internal processes, such as increased adoption of clean technologies, processes with lower energy burden and material reuse, recycling and remanufacturing. However, their research only considered collaboration with suppliers. Case studies of Hall (2000) showed that improvements in environmental sustainability of internal processes might occur primarily for one of the two parties and depend on the party's

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buyer/seller position in the dyad and characteristics of the relationships. Therefore, we examined two types of dyads: environmental collaboration with suppliers and customers. The goal of the present paper is to explore the potential of environmental collaboration with suppliers and customers to induce environmentally sustainable process improvements to address external sustainability pressures (such as market and consumer demand for environmentally sustainable production and distribution and regulatory pressure to reduce environmental impact) and to improve business performance.

Another gap we address concerns potential indirect relationships between environmental collaboration and firm performance. Most studies on environmental collaboration examined a *direct* impact of inter-firm linkages on firm-level performance (see i.e. Zhu et al. (2007), De Giovanni (2012), Gimenez and Tachizawa (2012)). However, two resource-based view (RBV) spin-offs, the relational view (Dyer and Singh, 1998) and the extended RBV (Lavie, 2006), suggest that environmental collaboration can influence firm performance *indirectly*: it creates joint collaborative advantage for both parties and the share appropriated by each party contributes to firm-level performance. Innovation is one of the corner stones of (joint) collaborative advantage (Cao and Zhang, 2012). Considering environmentally sustainable process improvements introduced by the focal firm as an appropriated part of collaborative advantage, we investigate the indirect effect of environmental collaboration on firm performance via environmentally sustainable process improvements. These are modifications or introductions of new internal business processes that reduce environmental impact (e.g. prevent pollution, reduce material and energy usage, reduce and valorize the waste). Providing manufacturing managers with better understanding of direct and indirect relationships between environmental collaboration and firm performance can gain them more control over environmental collaboration outcomes.

The Dutch food and beverage (F&B) processing industry is an interesting case to study environmental collaboration as operations in this industry require an extensive use of natural resources and are responsible for considerable environmental impact (Statistics Netherlands, 2012). The Dutch F&B industry is one of the largest and most innovative F&B industries in the world, known for high sustainability achievements and strong cooperation. Not only the industry initiatives (Hart et al., 2011), but also public policy is increasingly shifting from targeting environmental impact of an individual firm towards the supply chain level (Vermeulen and Kok, 2012). From an academic perspective, research on collaboration for sustainability in the food industry is scarce (Manzini and Accorsi, 2013) but is required to stimulate the discussion on the industry role in the context of environmental collaboration.

The paper is organized as follows. Section 2 discusses the relationships between environmental collaboration, environmentally sustainable process improvements and firm performance in light of RBV spin-offs. In Section 3, the research model and hypotheses are presented. Then the approach to data collection and analysis is described, followed by analysis of collected data. Section 6 discusses our findings, implications and avenues for future research.

2. Theoretical foundation

The theoretical framework of the present study is grounded in RBV spin-offs: relational view and extended RBV. Together they underpin hypotheses linking environmental collaboration, environmentally sustainable process improvements and firm performance.

The RBV originated as an attempt to look for factors that explain the firm's performance inside the firm as opposed to the Porterian approach. Resources and capabilities, which are heterogeneous across firms and imperfectly mobile, generate above-normal rents and a sustained competitive advantage if they are valuable, rare, imperfectly imitable and non-substitutable (Barney, 1991). The RBV considers only rents generated by an individual firm as a unit of analysis in accordance with the competitive paradigm (viz. quasi-rents, ricardian, monopoly rents (Peteraf, 1993)).

Especially in environmental management, the research focus is shifting for over a decade from the individual firm level towards collaboration in supply chains and networks (Reed, 2008; Sarkis et al., 2011). Among reasons for this increasing interest in environmental collaboration is the inability to reduce environmental impact of the final product without considering the contribution of preceding stages of the supply chain. Although the RBV is widely used in environmental collaboration literature (Sarkis et al., 2011), RBV's application is limited by its embeddedness in the competitive paradigm that disregards cooperation benefits. This led to an increasing popularity of RBV spin-offs that rest on the cooperative paradigm (i.e. Vachon and Klassen (2008), Cheng and Sheu (2012)) with the premise that competitive advantage can be derived from collaboration.

The relational view (Dyer and Singh, 1998) conceptualizes inter-firm relationships as a source of competitive advantage and of a new type of rents (*relational rents*) created by the dyad in collaboration. Relational rents are derived through e.g. combining complementary and related resources and capabilities, learning and knowledge sharing. Collaborative (joint competitive) advantage, created in collaboration, has the following dimensions: innovation, quality, process efficiency, flexibility and other business synergies (Cao and Zhang, 2012). Consequently, innovation such as sustainable process improvements, is one of the benefits from environmental collaboration that can enhance firm performance. For instance, environmental collaboration with supply chain partners can induce modifications that lead to lower material and energy usage, waste and waste treatment cost, and pollution prevention that in turn can contribute to firm performance. However, the relational view considers collaboration benefits as joint for a dyad. It is not clear to what extent an individual firm can appropriate these benefits and enhance individual firm-level performance. Extended RBV addresses this gap.

The extended RBV (Lavie, 2006) offers the framework of competitive advantage of collaborating firms that addresses the shortcomings of the RBV and the relational view. Extended RBV redefines the rents of collaborating firms taking into account the problem of appropriation. The rent of collaborating firm includes, among the others, the share of relational rent the focal firm could appropriate and (un)intended involuntary gains from (non)shared partner's resources due to i.e. bargaining power, absorptive capacity and opportunism.

Suggested by the extended RBV rent composition has an important implication for our research: environmental collaboration is not only directly related to the firm performance. There is an indirect link from collaboration to performance through a share of collaboration benefits that the firm could appropriate. Sustainable process improvements, as an example of innovation, are one of the building blocks of collaborative advantage (Cao and Zhang, 2012; Möller and Törrönen, 2003). Consequently, environmental collaboration can influence firm performance: (1) *indirectly* by appropriating a part of collaborative advantage, i.e. via environmentally sustainable process improvement achieved due to environmental collaboration and (2) *directly* by appropriating a part of collaborative advantage realized by partners, i.e. lower inputs prices as a result of internal process improvements achieved by partners.

Empirical work of Cao and Zhang (2011) reflected on these theoretical developments. They found that supply chain collaboration has a positive impact on collaborative advantage that