


Chapter 11

What Drives Eco-Design Innovations in European SMEs?

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ABSTRACT

Building on the natural-resource-based view, and using a sample of 7,165 European SMEs, this chapter investigates the drivers of eco-design innovations among SMEs under three categories: (1) sustainability-oriented firm capabilities, (2) technological capabilities, and (3) access to finance. The findings reveal that sustainability-oriented capabilities achieved through investments into circular economy are the strongest driver of SMEs' eco-design innovations. Firms' technological capabilities are also found to boost their ability to adopt eco-design innovations. While equity finance increases the possibilities for SMEs to devote resources to eco-design, grant finance is interestingly observed to decrease such possibilities. The more traditionally used form of debt finance remains detached from eco-design implementations. The study contributes to a better understanding of how eco-design practices can be broadened within SMEs and highlights policy recommendations in this regard.

1. INTRODUCTION

The social and regulatory pressures for companies to take into account their environmental impact are on the rise and penetrate the activities of small businesses as well as their large counterparts. Hence, enterprises of all sizes are expected to introduce environmental innovations (i.e., eco-innovations) to ensure their environmental impact can be curbed whilst corporate performance is not affected (Battaglia et al., 2020). Despite some recent contributions, the eco-innovation (EI) efforts and potential of Small and Medium-Sized Enterprises (SMEs) remain less explored in the eco-innovation literature, with most efforts concentrating on large firms (Hoogendoorn et al., 2015). Given their substantial impact on the environment, with 60-70% of the total pollution being caused by SMEs alone, exploring SMEs' eco-innovations and their environmental impact stands as a crucial issue (European Commission, 2010).

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Understanding the product eco-innovations are particularly key for SMEs that focus the majority of their innovation efforts on products (Bossle et al. 2016). Recent literature states that it is crucial to intervene during the design stage of the product/service innovation through “eco-design,” evaluating the environmental consequences of products through the product life cycle (Boks, 2006; Deutz et al., 2013). The design stage of the innovation process is a key intervention point in the life cycle of a product for any environmental considerations (Deutz et al. 2013) and determines 80% of the environmental impact any product or service is likely to incur through its life cycle (McAloone and Bey, 2009). Recent policy efforts such as the Waste Electrical and Electronic Equipment (WEEE) Directive and Restriction of the use of Hazardous Substances (RoHS) Directive and Eco-design Directive (European Commission, 2009) aim to systematically integrate environmental considerations in product design. While eco-design is accepted as an important element in new product development, more detailed empirical evidence is required for a better understanding of the factors that affect the introduction of such practices within firms in general and SMEs in particular.

Building on the natural-resource-based view of the firm (NRBV) and eco-innovation literatures, we aim to shed light on this under-researched area by exploring the role of (1) sustainability-oriented firm capabilities, (2) technological capabilities, and (3) access to finance, on eco-design innovations of SMEs. We use a database of 7,165 SMEs from 28 EU countries acquired by the Flash EuroBarometer 441 survey in 2016. Given the crucial role of SMEs in the economy and businesses (European Commission, 2010), the eco-design practices of SMEs deserve close attention (Hoogendoorn et al., 2015). Our results indicate that sustainability-oriented capabilities are the strongest driver of eco-design innovations. Broader technological capabilities of SMEs are also observed to increase SMEs’ ability to adopt eco-design practices. Access to equity finance is positively and significantly associated with adopting eco-design activities, increasing the willingness of SMEs to devote resources to such projects. However, access to grant finance decreases the possibilities of SMEs to conduct eco-design. Debt finance, on the other hand, does not have a significant impact on eco-design activities.

The following sections outline the theoretical foundations and empirical evidence, as well as the methodology and data that were used to empirically investigate the relationships focal to the study. Finally, the results are presented, and implications are discussed. The study concludes with avenues for further research.

2. THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT

The *resource-based view* (RBV) and the *natural resource-based view* (NRBV) provide the theoretical foundations for discussing eco-innovations in general and eco-design innovations in particular. The RBV from the strategic management literature assumes that unique, non-substitutable, and difficult to imitate resources and capabilities are the sources of competitive advantage (Barney, 1991). The NRBV, building on RBV and dynamic capabilities literature, states that environmental constraints lead firms to adjust and renew their capabilities and resources in a way to obtain new sources of competitive advantage through achieving sustainable technologies and products (Hart and Dowell, 2011; Hart, 1995). In this paper, we use the NRBV as a foundation to understand the role of a firm’s resources and capabilities that facilitate its ability to introduce eco-design innovations.

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