

Environmental management

Relationship between eco-innovations and the impact on business performance: an empirical survey research on the Brazilian textile industry

As relações entre eco-inovações e o impacto na performance empresarial: uma pesquisa empírica na indústria têxtil brasileira

Las relaciones entre las ecoinnovaciones y su efecto en el desempeño empresarial: un estudio empírico en la industria textil brasileña

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Abstract

This study draws from the resource-based theory and investigates the interrelationships between three types of eco-innovation (process, product, organizational) and their impact on business performance. Using a structural equation design with 70 samples collected from textile industry, research results show that business performance is affected by product and organizational eco-innovations. The process and product eco-innovations significantly influence the effects of organizational eco-innovation, and there are connections between process and product eco-innovations. Research reveals that each type of eco-innovation has its own attributes, determinants, and contributions to business performance. Study on the textile sector broadens the discussion of interdependence and co-evolutionary relationships among different types of eco-innovation and demonstrates that the development of efficient innovation programs requires a holistic view and organizational and technological capabilities.

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Keywords: Sustainable innovation; Eco-innovation; Business performance; Textile industry

Resumo

Este estudo usa a teoria baseada em recursos e investiga as inter-relações entre três tipos deecoinovação (processo, produto, organizacional) e o seu impacto na performance empresarial. Com o uso de uma modelagem de equações estruturais e com uma amostra que envolveu 70 empresas têxteis, os resultados da pesquisa indicam que a performance empresarial é afetada por ecoinovações de produto e ecoinovações organizacionais. A ecoinovação organizacional influencia significativamente os efeitos das ecoinovações de processo e de produto e existem relações entre as ecoinovações de processos e de produtos. A pesquisa revela que cada tipo de ecoinovação tem seus próprios atributos e determinantes e que

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contribuem positivamente para a performance empresarial. O estudo no setor têxtil amplia a discussão sobre a interdependência das relações coevolutivas entre os diferentes tipos de ecoinovação e demonstra que o desenvolvimento de programas de inovação eficientes requerem o aprimoramento das capacidades organizacionais e tecnológicas.

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Palavras-chave: Inovação sustentável; Eco-inovação; Performance empresarial; Indústria têxtil

Resumen

En este trabajo se utiliza la teoría basada en los recursos y se estudian las interrelaciones entre tres tipos de ecoinnovación (proceso, producto, organizacional) y su impacto en el desempeño empresarial. Se utilizan modelos de ecuaciones estructurales, con una muestra de 70 empresas del sector textil. Los resultados indican que el desempeño corporativo es afectado por las ecoinnovaciones de producto y ecoinnovaciones organizacionales. La ecoinnovación organizacional influye significativamente en los efectos de las ecoinnovaciones de proceso y de producto. Además, existen relaciones entre las ecoinnovaciones de procesos y de productos. Se sugiere que cada tipo de ecoinnovación tiene sus propios atributos y determinantes, y que contribuye positivamente al desempeño de la empresa. El estudio en la industria textil profundiza el debate sobre la interdependencia de las relaciones coevolutivas entre los distintos tipos de ecoinnovación, y demuestra que el desarrollo de programas de innovación eficientes requiere el perfeccionamiento de las capacidades organizacionales y tecnológicas.

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Palabras clave: Innovación sustentable; Ecoinnovación; Desempeño empresarial; Industria textil

Introduction

Innovation Establishes New Forms of Competition and Cooperation, and is based on changes in processes, product (goods and services) and management models. Companies with differentiated technological capabilities have a set of valuable organizational resources that are rare and difficult to imitate (Atalay, Anafarta, & Sarvan, 2013). These resources may be heterogeneous (i.e. in larger quantities and differentiated when compared to the competition) and immobile (cannot be purchased easily on the market). Organizational structure defines hierarchy, resources, capabilities, and the decision-making process (Barney & Hesterly, 2007; Cook, Bhamra, & Lemon, 2006).

The confluence of the discussion on innovation with the demands of a global society for sustainability derives from the concept of eco-innovation (Rennings, 2000). This type of innovation is characterized by creation of something new in order to reduce environmental impacts and thus influences social attitudes and cultural and institutional values (Manzini & Vezzoli, 2011; Organisation for Economic Co-operation and Development [OECD], 2009). The use of renewable energy technologies, development of pollution prevention systems, organic agriculture, creation of green investment funds and carbon emission technologies are examples of eco-innovation (Arundel & Kemp, 2009; Ekins, 2010; Kemp & Pearson, 2008; Kemp, 2009).

Studies on eco-innovation by companies should take a holistic view in their development, with the understanding that this may occur in different ways, in different objects and with specific attributes (Carrilo-Hermosilla, del Río, & Könnölä, 2010; Maçaneiro & da Cunha, 2012). In addition to descriptive and prescriptive analysis of the types of eco-innovation, most studies focus on the development and performance of individual eco-innovation programs (e.g., Anttonen, Halme, Houtbeckers,

& Nurkka, 2013; Pujari, 2006), such as: innovation products or services (Chou, Chen, & Conley, 2012; Xing, Ness, & Lin, 2013), technological innovations (Moore & Ausley, 2004; Tseng, Wang, Chiu, Geng, & Li, 2013), infrastructure and policy innovations (Rehfeld, Rennings, & Ziegler, 2007; Shin, Curtis, Huisingsh, & Zwetsloot, 2008). Therefore, understanding the interrelationships that exist among the different types of eco-innovation is vital for its development and implantation.

Cheng, Yang, and Sheu (2014), inspired by Barney's (1991) resource-based view (RBV), proposed to analyze the relationships between the types of eco-innovations using the typology proposed by Cheng and Shiu (2012). In this typology, eco-innovation can manifest itself in three types: process, product and organizational. The eco-processes are linked to new production methods, including zero CO₂ emissions, zero losses and eco-efficiency in the management of natural resources. The eco-products include innovations via product improvement or radical changes through eco-design, sustainable technologies and reverse engineering to minimize the environmental impact of these products. The organizational eco-innovation, meanwhile, involves new programs and techniques linked to organizational systems, and include lifecycle assessment tools, cleaner production and sustainable consumption.

Creativity and innovation in the textile industry are strongly present in the redesign of products that meet customer requirements and reflect the improvement of business performance. Jones, Hillier, and Comfort (2012) emphasize the importance of developing innovative technologies to solve the environmental and social impacts of the textile industry. These issues involve the high consumption of water and energy, the cost of transportation and the final destination of these clothes, the use of pesticides in cotton plantations, the bleaching and washing process that fabrics go through, the final destination

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