Chapter 3

Effect of Green Attributes in Obtaining Benefits in the Manufacturing and Marketing Process

José Roberto Mendoza-Fong
https://orcid.org/0000-0001-9768-4290
Universidad Autónoma de Ciudad Juárez, Mexico

Jorge Luis García-Alcaraz
https://orcid.org/0000-0002-7092-6963
Universidad Autónoma de Ciudad Juárez, Mexico

Liliana Avelar Sosa
https://orcid.org/0000-0001-9490-2520
Universidad Autónoma de Ciudad Juárez, Mexico

José Roberto Díaz Reza
Universidad Autónoma de Ciudad Juárez, Mexico

ABSTRACT

New environmental tendencies have been incorporated into supply chains, and suppliers are playing an important role. However, the main problem when selecting a green supplier is determining the attributes that contribute to a green supply chain. Moreover, a lot of companies ignore the benefits gained from green suppliers on economic performance and marketing. Therefore, this chapter reports a structural equation model with three latent variables (Green attributes of suppliers, Marketing benefits, and Manufacturing processes benefits) and three hypotheses are proposed with relationship among them. The model is validated with information from 253 questionnaires administered to Mexican maquiladoras and evaluated using partial least squares. Findings demonstrate that maquiladoras that consider Green attributes in supplier selection process are gaining marketing and economic benefits, contributing to a green supply chain, and improving the corporate image as socially responsible organizations.

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INTRODUCTION

Supply chain management (SCM) can be defined as the management of materials and information flow within and among the facilities of companies, including suppliers, manufacturers, assembly plants, and distribution centers (Aloini, Dulmin et al., 2015). Certain authors argue that any supply chain begins with the suppliers; therefore, decisions related to their selection are considered major responsibilities. Moreover, the selection and evaluation of suppliers is one of the most relevant and complex activities of study, since they are viewed as a competitive advantage in the globalized market.

Fortunately, nowadays, there are a lot of techniques and methods that support the supplier selection process. As an example, from the literature review by Chai and Ngai (2015) from 123 journal articles, they propose a taxonomy of multicriteria decision making techniques (MCDM), mathematical programming techniques (MP), and artificial intelligence techniques (AI). Moreover, a more recent research categorized the methods for green supplier selection that are available in multi-criteria decision-making approaches and that methods include the analytical hierarchy process (AHP), the analytical network process (ANP), case-based reasoning (CBR), data envelopment analysis (DEA), fuzzy set theory, genetic algorithm (GA), mathematical programming, and their hybrids (Govindan, Rajendran et al. 2015).

These techniques can be used in different situations and contexts (Hamdan & Cheaitou, 2017), since each company has its own priorities and thus evaluates different attributes from a supplier (Al-Sheyadi, Muyldermans et al., 2019). However, it has been argued that traditional attributes are mostly associated with the quality of materials, costs, and delivery times. All of them can be quantitatively expressed, while qualitative attributes are often set aside, since they are more difficult to incorporate into supplier evaluation models (Simić, Svirčević et al., 2015).

Nevertheless, nowadays there is a growing awareness of environmental problems from consumers and manufacturers. That is, the consequences of manufacturing operations have become salient issues (Thakker & Rane, 2018), since environmental damages are more visible. Pollution and waste are increasing, and resources for raw materials are becoming scarce (Gurel, Acar et al., 2015). Therefore, in addition to offering lower costs, higher quality, and short delivery times, suppliers today must prove environmental responsibility and awareness (Paterson, Berry et al., 2014).

The emergence of such green tendencies in supply chains has given birth to green supply chain management (GSCM) (Mendoza-Fong, García-Alcaraz et al., 2017), that is related to the way companies rely on their suppliers for different processes. Similarly, it refers to their ability to integrate environmental concerns to improve their competitive advantage (Jabbour & de Sousa Jabbour, 2015). Therefore, there are two essential practices of GSCM: green supplier selection and the maintenance of environmental practices along the supply chain (Mendoza-Fong, García-Alcaraz et al., 2017). This paper analyzes the former practice, although it must be remembered that, since supply chains are globalized, full environmental commitment is achieved by considering the different environmental regulations that each country must follow (Wu & Wu, 2015).

As a manufacturing facilitator or host country, Mexico currently has more of one thousand subsidiaries companies established in border cities of Mexico with USA. These subsidiaries are known as maquiladoras (manufacturers), and they attempt to reach markets in the United States of America (USA) and Canada by taking advantage of the North American Free Trade Agreement (NAFTA), which has been signed by these three nations. In Ciudad Juárez one of the border city of Mexico with USA, the Mexican maquiladora sector sustains 220,090 direct jobs and imports of $22.6 (USD) billions in raw materials and $43.0 (USD) billions in final product exports.