Chapter 9

Evaluation of Financial and Economic Effects on Green Supply Chain Management With Multi-Criteria Decision-Making Approach:
Evidence From Companies Listed in BIST

Hasan Dinçer
İstanbul Medipol University, Turkey

Serhat Yuksel
Istanbul Medipol University, Turkey

Tuba Bozaykut-Buk
Istanbul Medipol University, Turkey

ABSTRACT

This chapter aims to analyze the financial and economic effects on green supply chain management of the food and beverages industry. For the research purpose, the fuzzy DEMATEL and fuzzy MOORA methods are used for the integrated model construction. The main stages of the green supply chain are considered as the dimensions and the selected performance measures are listed as a set of criteria for each dimension. Accordingly, 21 food and beverage companies listed in Istanbul Stock Exchange (BIST) are employed to measure the performance of green supply chain processes. It is concluded that low pollution is the most important criterion whereas alternatives has the least weight. Reverse logistic is also second most significant criterion which means that these companies give importance to reduce their costs. It is also found out that there is not a certain correlation between green supply chain management performances with the profitability of the firms. However, it can be seen that bigger firms have higher green supply chain management performance than the smaller firms.

INTRODUCTION

The interconnectedness of customer satisfaction and firm performance make green supply chain management (GSCM) as one of the most discussed and analyzed topics during the last decade. The foremost reasons behind the popularity of GSCM are the increase in the environmental awareness (Sari, 2017), the share of logistic costs in the finished products (Nikbakhsh, 2009), meeting stakeholder needs (Srivastava, 2007) and social sustainability (Fahimnia et. al., 2015). Also, these motives refer to the driving forces to adopt GSCM practices for competitive superiority. Moreover for firms, institutional pressures like ISO4001 certification indicate environmental management as a strategic issue for both economic and environmental performance (Diabat and Govindan, 2011). Thereby, greening through environmental standards is a factor of market success (Min and Galle, 1997) by enhancing competitiveness, resource productivity and innovation (Porter and van der Linde, 1995).

Through globalization, firms' coordination in the supply chains turns out to be the most critical business success factor (Lambert et. al., 1998). As a consequence, the management philosophy that starts with logistics management evolving to GSCM is an outcome of global markets and "globalization of supply" (Mentzer et. al., 2001:2). Besides globalization of supply, GSCM develops for predicting, minimizing and preventing environmental harms given by supply chain operations (Beamon, 1999; Sari, 2017). Thereby as an attempt to form an ecological nature for an organization, green supply chains (GSC) refers to "developed and advanced form of traditional supply chains with a special aim of reducing the environmental harm given during a product's life cycle" (Mishra et.al, 2017:86). Parallel to these, GSCM comprises elements of both corporate environmental management and supply chain management (Srivastava, 2007; Laari et. al., 2017). In line with this thinking, GSCM consists of numerous R activities (e.g. reduce, re-use, and recycle) (Sirvastara, 2007). These R activities provide firms to coordinate their purchasing, production and distribution processes in an environmentally-friendly manner for a better economic, ecological, operational, and social performance (Geng et. al., 2017).

Therefore, it is of paramount importance to determine the key factors of GSCM and measure GSCM performance in terms of these components. Concordantly, the current study aims (1) to present a literature review of determinants of GSCM, (2) to examine key components of green supply chain management and develop a multidimensional model for GSCM performance (3) to test the model through fuzzy-based decision making methodology, (4) to show which dimensions and criteria are more critical for a sustainable GSCM performance (5) help decision makers and researchers develop appropriate guidelines for GSCM success.

In line with these given aims, the paper continues with relevant literature on GSCM, its dimensions and its effects on firm performance. Following literature, the research methodology and the application of this methodology on 21 Food and Beverage companies listed in Istanbul Stock Exchange is discussed. Finally, the findings together with future implications are given.

THEORETICAL BACKGROUND

Supply Chain Management

As a management philosophy, supply chain management (SCM) has evolved from logistics management with a claim to enlarge the boundaries of the traditional understanding of logistics. Standing from this stance, SCM is defined by the Council of Logistics Management in 1986 as "the process of planning,

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