Lean JIT and Environmental Performance: an empirical analysis

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Abstract

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1. Introduction

Over the past decade there has been increasing research published on both the synergies and trade-offs between lean manufacturing, environmental practices, and environmental performance (Henao et al., 2019; Abualfaraa et al., 2020; Lobo Mesquita et al., 2022; Garza-Reyes, 2015; King and Lenox, 2009).

Referred to as 'lean-green', this growing research area often cites the Triple-Bottom-Line approach, which underscores the need for performance in economic growth, environmental preservation, and social responsibility, in order to achieve sustainability (Henao et al., 2019). Motivated by this body of research as well as our interest in sustainability studies, we have decided to study environmental practices and performance and how they interact with lean practices.

Abualfaraa et al. (2020) outline several research gaps and opportunities for those interested in lean-green manufacturing (Abualfaraa et al., 2020). In their Structured Literature Review of articles published between 2000 and 2018, they have identified several research directions in both the synergies and incompatibilities between environmental and lean practices. On one line, it is argued that lean practices may work as a catalyst for environmental practices and innovation. On the other, the incompatibilities between objectives of the two approaches are highlighted. This could be, for example, fulfilling customer requirements with small lot sizes and high replenishment frequency, which in turn could lead to higher emissions and more packaging waste.

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The review also pointed out the need for more quantitative research with a focus on robust, well-defined sustainability metrics. Through an analysis of environmental practices and performance with lean practices as a moderating variable, our goal is to contribute to this research gap (Abualfaraa et al., 2020).

2. Theory

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3. Methods

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4. Results

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5. Conclusions

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