JIT and Environmental Performance: an empirical analysis

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Abstract
TBA

1. Introduction

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

These combined approaches, often dubbed 'lean-green', typically cites the Triple-Bottom-Line concept, which postulates 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 the effect of environmental and lean practices on environmental performance.

Abualfaraa et al. outline several research gaps and opportunities for those interested in lean-green manufacturing. 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 (Abualfaraa et al., 2020). On one line, it is argued that lean practices may work as a catalyst for environmental practices and innovation through its focus on waste reduction and continuous improvement. On the other, the incompatibilities between the two approaches are also studied. Just in time (JIT) practices have been specifically highlighted. For example JIT manufacturing practices such as small lot sizes and high replenishment frequency implies more frequent transportation, higher CO2 emissions and more packaging waste (Dieste et al., 2019).

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Literature reviews also pointed out the need for more quantitative research with a focus on robust, well-defined sustainability metrics (Abualfaraa et al., 2020). Through an empirical analysis of JIT and environmental practices, our goal is to contribute to this research agenda.

2. Literature Review

WIP

RQ 1: What effect does JIT practices have on overall environmental performance?

RQ 2: What are the combined effects of JIT and environmental practices on environmental performance?

RQ 3: What is the effect of JIT practices on C02 emissions and packaging waste?

3. Hypothesis

WIP

H1: Environmental practices and JIT practices are complementary: the implementation of JIT practices increases the marginal return of environmental practices on environmental performance and vice versa.

POTENTIAL H2: JIT practices are positively correlated with single measures of overall environmental performance.

POTENTIAL H3: JIT practices are negativly correlated with reducing CO2 emissions and packaging waste.

POTENTIAL H4: JIT practices negativly moderate the effect of environmental practices on reducing CO2 emissions and packaging waste.

4. Methods

WIP

Confirmatory factor analysis

Complimentarity of lean JIT/ environemntal practices

Moderating effect of lean JIT

Exploratory factor analysis

5. Results

WIP

6. Discussion

WIP

Non english speaking literature often filtered out

Diffirent national contexts

Different industries

Critique of tripple bottom line is lack of novelty around the hardest problem, social sustainability

Solutions to the JIT/Green dilemma: They suggest that this can be done by, for example, selecting suppliers from a certain geographic area to enable truckload sharing for delivering or, when small amounts have to be delivered, managing the routes in order to supply multiple customers in the same area.

BACKLOG:

- Create environemental practice "bundles" using EFA (DONE)
- Run a CFA between JIT and EP - Understand how to properly deal with NA values in CFA
- Run correlations
- Check for complimentarity between JIT and EP bundles as per complimentarity paper approaches
- See if there is a better way then just dropping all NA rows
- Test moderating effect of JIT on EP bundles as per china paper
- We need to ask the specifics of the likert scale for the JIT measures
- Apply spell check to latek sections before submitting

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