

A Supply Chain Production Inventory Model for Deteriorating Product with Stock Dependent Demand under Inflationary Environment and Partial Backlogging

Keywords:

Deterioration, Inflation, Inventory, Stock dependent demand, Demand dependent production, Shortages, Partial backlogging, Supply chain, Production inventory model

Summary:

This paper introduces a two-echelon supply chain production inventory model designed for deteriorating products with stock-dependent demand operating within an inflationary environment. The model considers a finite time horizon, allows for shortages with partial backlogging, and assumes a production rate that is a function of the demand rate, enhancing its practical applicability. A numerical example and sensitivity analysis of various parameters are presented to illustrate the model's behavior.

The model integrates several realistic features often considered in isolation in prior research, including the effects of inflation, stock-dependent demand, product deterioration, and partial backlogging of shortages. By combining these factors, the study aims to provide a more comprehensive and applicable framework for managing production and inventory in supply chains dealing with perishable goods under inflationary conditions. The authors highlight the importance of considering these factors for accurate and effective long-term business planning.

Algorithms & Equations:

Equations:

- $0 \leq \beta \leq 1$
- $K \geq 1$
- $0 < \theta \ll 1$

Algorithms:

- None

Plagiarism Report:

Based on the provided text:

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* **Writing appears:** Human-written with possible inclusion of copied phrases or sentences.

* **Suspicious or repetitive patterns:** The frequent citation of "Tayal et al. (2014)" and "Tayal et al. (2015)" is a bit unusual. It could indicate a heavy reliance on the work of a particular research group, which isn't inherently plagiarism but warrants further investigation. The introduction references many researchers and papers, which is normal, but some phrases appear very similar to standard academic phrases.

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