



Three Warehouse Inventory Model with Stock and Price Dependent Demand Under Inflationary Environment

Priyanshi Choudhary, S.R Singh, Dipti Singh*

Department of Mathematics, Chaudhary Charan Singh University Meerut, India-250001

Email: choudharypriyanshi1107@gmail.com, shivrajpundir@gmail.com,

Corresponding author Email: singhdipti113@gmail.com,

Abstract:

In an increasingly dynamic economic environment, inventory systems must account for multiple interacting factors such as inflation, demand variability, and storage limitations. This study develops a three-warehouse inventory model consisting of one owned warehouse (OW) with limited capacity and two rented warehouses (RW_1 and RW_2) to effectively manage excess inventory. The model incorporates stock-dependent and price-dependent demand, reflecting realistic market behavior where demand is influenced by both the availability of goods and their selling price. The model is formulated mathematically to determine optimal replenishment policies, pricing decisions, and inventory allocation across the warehouses. Solution procedures are developed using optimization techniques, and the results are illustrated through numerical examples. Sensitivity analysis is conducted to examine the impact of key parameters such as inflation rate, price sensitivity, and storage capacities on the optimal solution. The findings demonstrate that incorporating both stock and price-dependent demand under inflationary conditions significantly improves decision-making efficiency.

Keywords: Stock and Price Dependent Demand ,backlogging , warehouse ,Non instantaneous deterioration ,Inflation ,Green Technology

*Corresponding Author