

Dynamic Lot-Size Model Allowing Lost Sales

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ABSTRACT

In practice, manufacturers sometimes do not supply products even though there is demand and they have sufficient stock to meet the requirements. Considering this practical context, we study the single item, time-varying demand problem allowing lost sales. The model that we develop is a variant of the Wagner-Whitin model and is based on assumptions: no allowance of backlogging, no capacity constraints, linear carrying costs. The properties of the optimal solution are characterized. It is shown that the demand for any period should be either fully met or completely lost, which depends on the marginal profit of unit production and the break-even point for the period in which the corresponding production decision is made. Based on these properties, DP(Dynamic Programming) algorithm is developed and then used to make comparisons with the W-W model with regard to the different cost structures. The cases relaxing assumptions are also investigated.