

On the performance of periodic inventory control policies^{*}

M. Zied BABAI^a, Aris SYNTETOS^b,
Ruud TEUNTER^c

^a *BEM Bordeaux Management School, France*

^b *University of Salford, UK*

^c *Lancaster University, UK*

Abstract

The periodic (T,s,S) policies have received considerable attention from the academic literature. Determination of the optimal parameters in such a setting is computationally prohibitive. However, a number of heuristic procedures have been put forward to facilitate this task. The performance comparison of these heuristics enables to choose the best performing heuristic under specific contexts. Though the importance of such a comparison for practical implementations, these heuristics have never been compared in an extensive empirical study. Such an investigation on 3,055 SKUs is carried out in this paper. Our study provides insights into the cost performance of (T,s,S) heuristics.

Key words: Inventory control; Forecasting; Heuristics; Empirical Analysis, Simulation

1 Introduction

The (T,s,S) form of the periodic stock control system has been widely discussed in the academic literature. Under this form of stock control, the inventory position is reviewed at the end of a fixed period (T) and if it is found to be less than (or in some cases less than or equal to) the re-order level (s) enough is ordered to bring this up to the replenishment level (S). Determining the optimal values of these levels (parameters) though is computationally prohibitive. That is to say, there are currently neither simple procedures nor algorithms to give the optimal values of s and S in any particular practical situation. However, various heuristic procedures have been put forward, usually justified on the basis of generated data with known properties. The heuristics that have attracted most attention from the academic community are: i) the Power Approximation ([4]; [5]); ii) Naddor's heuristic [9]; and iii) the Normal Approximation [25]. In addition, practising stock controllers very often develop simple rules which relate alternative sets of (s,S) values to ranges of annual demands and the value or

^{*} This paper was not presented at any other revue. Corresponding author M. Z. Babai. Tel. +33 5 56 84 63 51. Fax +33 5 56 84 55 00

Email addresses: mohamed-zied.babai@bem.edu (Mohamed Zied Babai), a.syntetos@salford.ac.uk (Aris Syntetos), r.teunter@lancaster.ac.uk (Ruud Teunter).