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Intermittent demand forecasting: an empirical study on accuracy and the risk of obsolescence

(Revised paper submitted for peer review to the *Int. Journal of Production Economics*)

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Abstract

Intermittent demand items account collectively for considerable proportions of the total stock value of any organization. Forecasting the relevant inventory requirements constitutes a very difficult task and most work in this area is based on Croston's estimator that relies upon exponentially smoothed demand sizes and inter-demand intervals. This method has been shown to be biased and a number of variants have been introduced in the literature, including the recently proposed TSB method that updates the demand probability instead of the demand interval and in doing so reacts faster to decreasing demand. The TSB has been shown theoretically to be unbiased (for all points in time), but its empirical performance has not been investigated yet and this constitutes one of the objectives of our work. More generally, we explore the empirical performance of forecasting methods used in an intermittent demand context, paying particular attention to the effects and implications of the smoothing constant values employed for updating purposes. We do so by means of experimentation on large empirical datasets from the military sector and automotive industry. The results enable insights to be gained into the sensitivity of the various methods' forecasting and stock control performance to the smoothing constant values used. The paper concludes with an agenda for further research.

Keywords: Intermittent Demand, Forecasting; Smoothing Constants, Obsolescence, Empirical Analysis.

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