50th Anniversary Paper

Commentary on Burgin and Wild (1967): Stock control—experience and usable theory

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The paper by Burgin and Wild¹ has been selected by a previous Editor, namely Ray Cuninghame-Green, and I have been asked to comment on the significance of the work from my perspective as the JORS Topic Advisor on Inventory Control. Mine is a particularly pleasurable task as my introduction to OR came from working with the OR Group at the Dunlop Company Ltd, headed by Tim Burgin. The interest he generated in me for OR and inventory control in particular has given me great pleasure (and employment) ever since.

The paper needs setting in the context of when it was written. The early 60s had great belief in the 'White Heat of Technology' (aka Tony Benn, Minister of Technology at the time). It was a period when it was believed all the world's problems could be solved by science. This conviction carried across to management and the use of OR which, when it was coupled with the then new computers, would lead to optimal control (and without management intervention).

It is perhaps worth remembering that the computers of the time were huge unwieldy beasts that read and sometimes devoured punched cards and paper tape, and depended on reels of magnetic tape for memory. The work described in the paper was done for the Dunlop Company Ltd and the important transaction records were on punched cards delivered from the base stores to the computer room by a man on a bicycle. I know of more than one occasion when the rider fell off, and scattered his precious, carefully sequenced cards to the wind and dirt of the factory—an early form of data warehousing!

At the time the concepts associated with stock control were very simple. Without OR, managers had set minimum stock levels or re-order levels by intuition, or sometimes for the more numerate, in terms of weeks cover. The standard OR model of the time was a gross simplification of the real world, representing demand as a normally distributed random variable from which the re-order level could be

computed when supplied with a specified probability of running out of stock.

It was against this background that the paper by Burgin and Wild was written. They had experienced the store managers at Dunlop who robustly pointed out that they preferred to guess a reorder level than try to select a 'probability of running out of stock' for each and every item. Therefore the authors wanted to reduce the volume of information required and move the optimisation process into terms managers could understand and work with. As with most major shifts of direction, the new approach required several steps.

First the authors had to find a more reasonable representation of demand, and after considerable testing on real data, selected and thereafter worked with the family of Gamma distributions. They then moved from calculating the re-order level from probabilities to a real measure of service, which unfortunately for us juniors of the department, necessitating calculating tables of lost sales by hand. Having obtained a suitable model for a single item they developed it to handle the stocking requirements across a product range. In order to make forecasting a manageable task, Burgin and Wild proposed and measured a quadratic variance law, linking the variability of sales and the average demand. They then evaluated how the re-order levels should be set across a range of items to meet an accepted management criteria namely maximising the rate of return subject to a financial limit on investment. In achieving this step the paper took stock control to a strategic level, and gave it a real management role. It well deserved the OR Society's Bronze Medal, awarded to its authors in 1967 and also its selection in this commemorative series.

Reference

- 1 Burgin TA and Wild AR (1967). Stock control—experience and usable theory. *OpI Res Q* 18: 35–52.