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Abstract:

The role of ABC analysis in inventory management is questioned. It is suggested that in some applications, particularly in the management of spare parts inventories, there is often insufficient stability in usage patterns to make ABC analysis a worthwhile approach.

Keywords: Inventory control, ABC analysis.

In a recent expository paper, Shorrock (1989) sketched the role of ABC analysis in inventory control. He identified the basis of the method as the fact that a small number of products often account for a large proportion of total annual usage value. He described how items could be ranked and classified into A, B and C categories by their annual usage value, proposed simple reordering rules based on these categories and then outlined a "quick and dirty" approach for estimating the investment in stock.

Although many advantages of ABC analysis were identified, Shorrock overlooked Browns' (1977) important argument that a total reliance on mechanistic ordering rules is not particularly desirable in the case of the A-items where, because of their relative small number, direct intervention by management to make decisions which embody the latest market intelligence is possible. Furthermore, he like many other authors failed to highlight the fact that the ABC technique relies on a presumed stability which may or may not be present in reality.

We first became aware of the problem of stability when developing procedures for controlling spare part inventories for an airline (Dunsmuir and Snyder, 1989). In this project the ABC technique was applied in two successive years to yield results similar to those shown in Table 1. The table in reminiscent of a transition matrix from the theory of Markov chains. Each cell of the table contains a number which represents the proportion of items in a particular category in 1986 which then move to another category in 1987. Thus, for example, the number at the intersection of row C and column A indicates that 3 percent of the C-items in 1986 became A items in the following year.

Under perfectly stable conditions all items stay within the same categories. Each diagonal element of the matrix then equals unity while all off-diagonal elements equal zero. Table 1 deviates quite markedly from this ideal form. In particular it indicates that 50% of the A-items changed categories between the two years, most in fact becoming C-items. This reflects the fact that the majority of spare parts were slow moving and that in many cases the elapsed time between successive usages extended beyond the period of a year. The annual usage value could therefore be zero in one year and a sizeable amount in another. In such circumstances the value of ABC analysis, let alone any scientific approach to inventory management, is open to serious doubt. This example highlights the fact that a blind application of ABC-analysis is fraught with dangers for the unwary and that the presumed stability implicit in most expositions of this technique may be completely absent.

References

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Shorrock, B. (1989) *Easy as ABC: A cost-effective approach to stock control,* OR Insight, 2, 12-13.

		1987		
	Category	A	B	C
	A	0.50	0.10	0.40
1986	B	0.02	0.75	0.23
	C	0.03	0.06	0.91

Table 1. Inventory Transition Matrix

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