

## Investing in setup reduction in the EOQ Model with random yields under a Limited Capital Budget

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### Abstract

In this paper, we attempt to determine the optimal capital investment in setup cost and optimal lot sizing policies to reduce yield variability for an economic order quantity model with random yields. We assume that the setup cost is the function of capital expenditure. We develop a solution procedure to determine the optimal lot size and the capital investment with a limited capital budget to minimize the expected total annual cost. Finally, a numerical example is presented to illustrate the procedure and to delineate the relationships between the optimal lot size and these investment decisions. These results evidently show that the performance on costs savings can be improved significantly through capital investment. Managerial implications are also included.

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*Keywords:* inventory; random yields; lot sizing; investment analysis

### 1. Introduction

The random yield production or procurement problem has become an important research topic in production and inventory studies. In particular, several papers have reported the implications of yield randomness

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