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Another look at the single-vendor single-buyer integrated production-inventory problem

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Pages 791-800 | Received 01 Aug 2005, Published online: 22 Feb 2007

 Cite this article  <https://doi.org/10.1080/00207540500334285>

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Abstract

This paper considers a supply chain in which a 'vendor' supplies a product to a 'buyer'. The vendor manufactures the product at a finite rate and periodically ships the output to the buyer. The buyer then consumes the product at a fixed rate. Costs are attached to manufacturing batch set up, the delivery of a shipment and stockholding at the vendor and buyer. The objective is to determine the production and shipment policy which minimizes long-run total average cost—assuming the vendor and buyer collaborate and find a way of sharing the consequent benefits. Most previous work has been based on the assumption that unit stockholding costs increase as stock moves down the supply chain, but recent research has suggested that the opposite may sometimes hold. We show how the optimal batch production and shipment policy may be derived when unit stockholding costs increase as stock moves down the chain and shipments are not necessarily equal in size.

Keywords:

- Production
- Inventory
- Single-vendor
- Single-buyer

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