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In This Issue

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A regular feature of *Manufacturing & Service Operations Management*, “In This Issue” briefly describes each issue’s articles and highlights their contributions.

Key words: editor’s comments; issue overview; summaries

“Hedging Inventory Risk Through Market Instruments,” by Vishal Gaur and Sridhar Seshadri

Are inventory decisions related to the financial markets? Not yet, but in this article the authors argue that they should be. Both consumer demand for discretionary purchase items (apparel, electronics, furniture, etc.) and stock prices are correlated with overall economic activity. This means that financial market instruments could potentially be used both to improve forecasting (via the information implicitly contained in market prices) and to hedge inventory risks. The authors show how to construct optimal hedging transactions that minimize the variance of profit and thereby increase expected utility for a risk-averse decision maker. They show that risk-averse decision makers order more inventory when they hedge their inventory risk with financial instruments. They also show how the price information of financial assets can be used to determine both the optimal inventory level and hedging strategy. The approach is illustrated using data from a major consumer electronics retailer.

“Using Bucket Brigades to Migrate from Craft Manufacturing to Assembly Lines,” by John J. Batholdi III and Donald D. Eisenstein

A “bucket brigade” is a self-balancing production line in which workers dynamically hand off and receive jobs from their up-stream and down-stream coworkers. As a method of work organization, it lies between the extreme job specialization of traditional assembly lines and the flexibility of craft production. In this

article, the authors report on an implementation of bucket brigades at an industrial tractor manufacturer who was making a transition away from craft production. While the bucket brigade introduced some overhead in terms of hand-off and walk-back times for this firm, the narrowing of tasks and subsequent learning benefits that resulted more than compensated and production improved. Motivated by this case, the authors build on their prior analytical work and extend the analysis of bucket brigades to allow for hand-off and walk-back times. Their model provides a means to quantify the productivity trade-offs inherent in moving from craft to assembly line production.

“An Optimal Production and Shutdown Strategy when a Supplier Offers an Incentive Program,” by Xiuli Chao and Frank Y. Chen

Energy buy back programs for manufacturers have grown in popularity in recent years. Under such programs, manufacturers voluntarily stop or reduce their production levels to save energy during peak periods in exchange for financial compensation (buy backs). The compensation depends on the amount of time that a firm reduces energy consumption during peak periods. In this article, the authors analyze this situation from the manufacturer’s viewpoint—in particular, whether it is worth shutting down production at a particular time to gain compensation under a buy-back program. They model the problem as a continuous time production/inventory control problem in which the optimal decisions of the manufacturer are

when (and for how long) to shut down and how much to produce while operating. They characterize the production and shutdown strategy for both the peak and nonpeak periods that minimizes total discounted cost.

“Quantifying the Value of Leadtime Information in a Single-Location Inventory System,” by Fangruo Chen and Bin Yu

Unreliable delivery times are a fact of life in almost all supply chains. While delivery leadtimes may vary due to inherently unpredictable events, often variations are due to causes such as production schedules and shipment plans that are known to the supplier. If the supplier does not share this delivery leadtime information with its buyers, then it creates uncertainty and potentially higher inventory costs. But what, exactly, is the value of this information? In this article, the authors compare a single-location inventory model in which leadtime information is known to one in which leadtimes are uncertain. They show that the value of sharing leadtime information can be significant and may reduce inventory costs by as much as 41%. This work complements the growing body of work on information sharing in supply chains by showing that sharing upstream delivery information may be as valuable as sharing downstream demand information.

“Decentralized Serial Supply Chains Subject to Order Delays and Information Distortion: Exploiting Real-Time Sales Data,” by Noel Watson and Yu-Sheng Zheng

Managers in a supply chain are typically evaluated on their ability to meet orders. Yet orders represent delayed and often distorted information about end-market demand. In this article, the authors show that such an order-focused view of management performance is fundamentally limiting. Instead, they propose a new decentralization scheme based on measuring echelon stock that makes every stage's performance independent of all others. Under this scheme, stage managers no longer have to respond to downstream decisions and are instead led to focus on meeting customer demand. The scheme requires sharing customer-demand information and encourages cooperation among managers up and down the supply chain. They show the scheme can be made incentive compatible given knowledge of the end-market demand distribution and the systemwide optimal inventory policy. A heuristic scheme is proposed in the case where demand information is not known, and numerical experiments show that the heuristic scheme is close to incentive compatible. The approach is extended to analyze decentralized serial systems with order delays and demand information sharing.